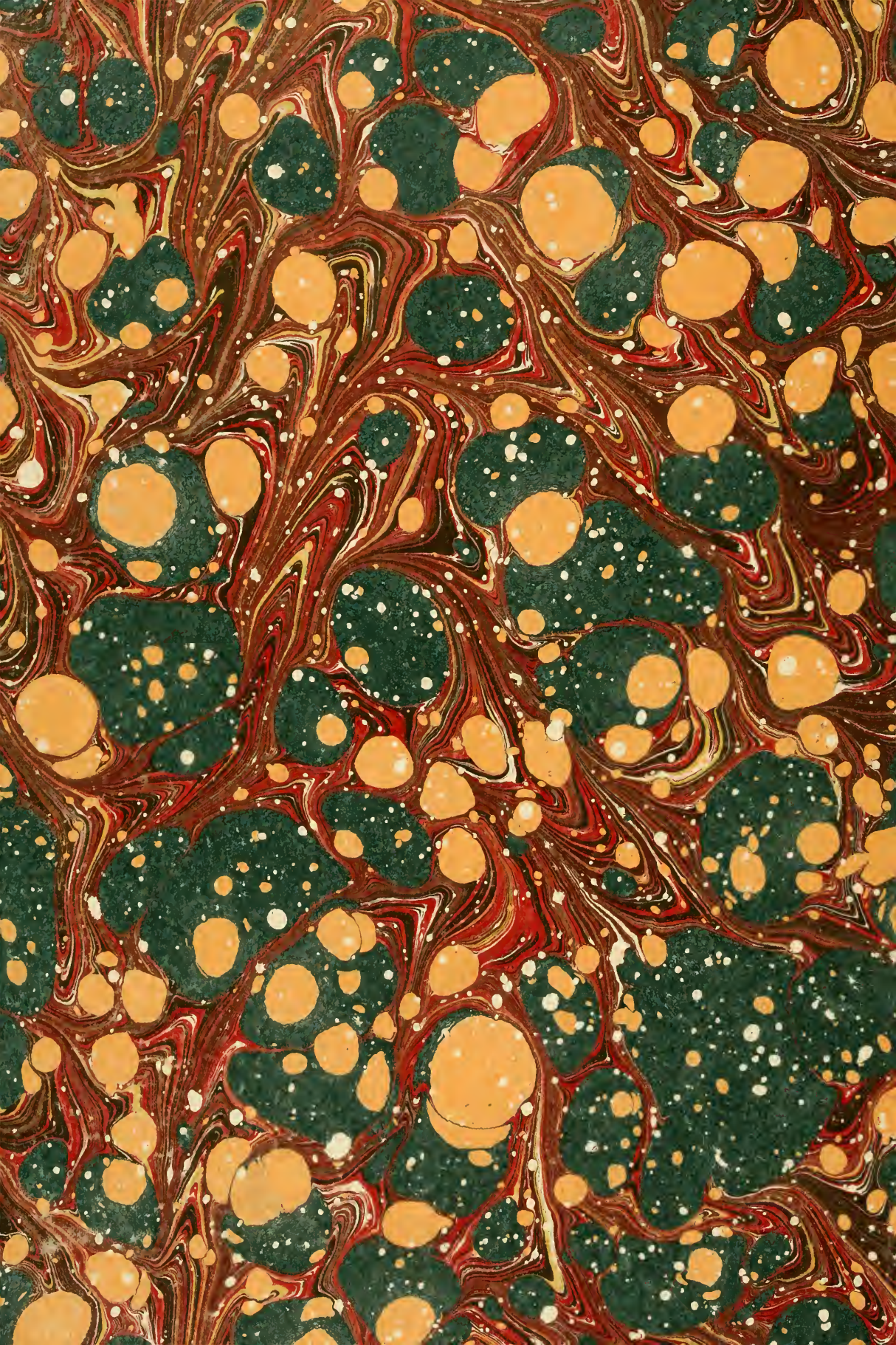
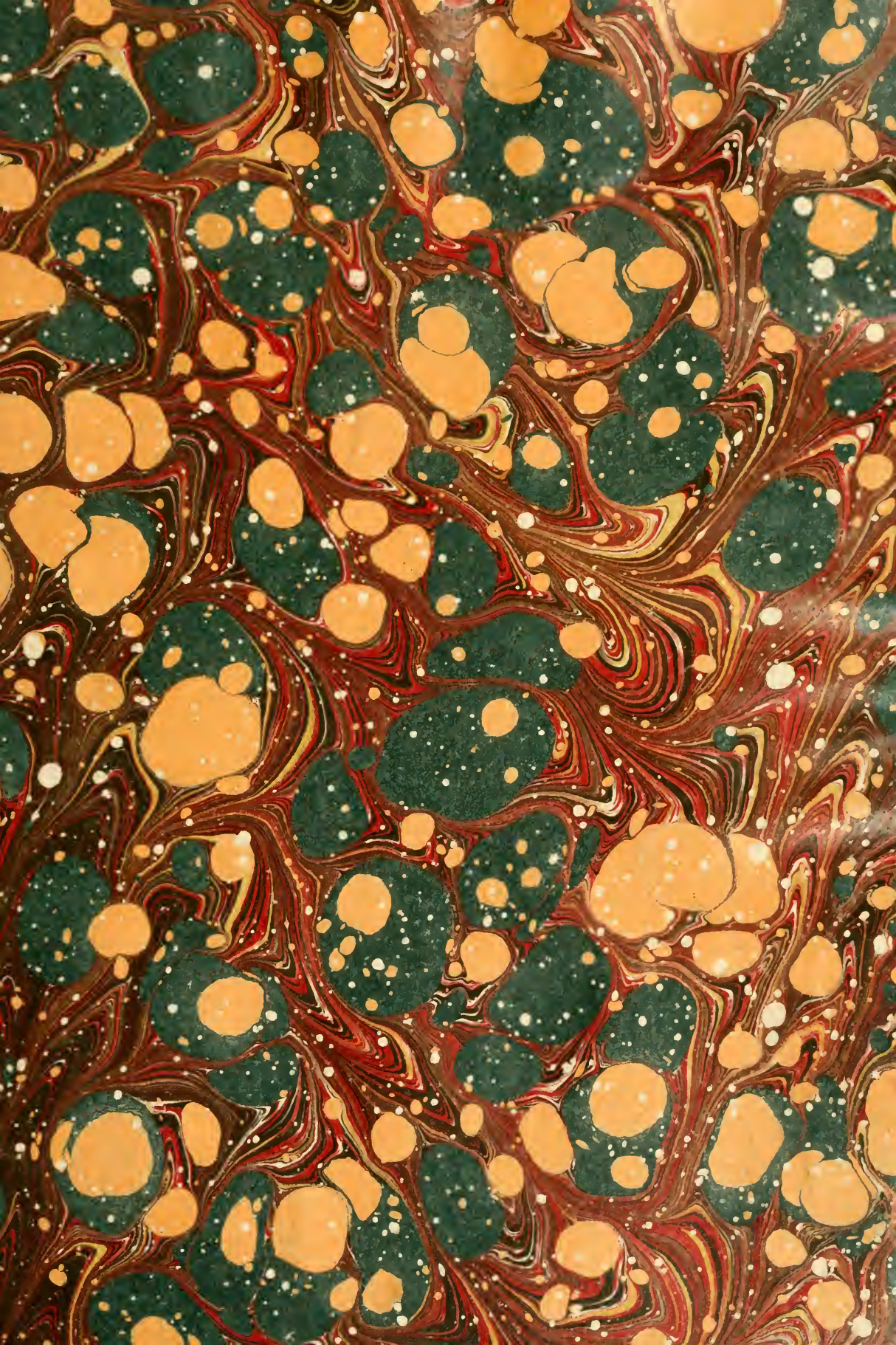
RURAL LIFE

ILLUSTRATED.





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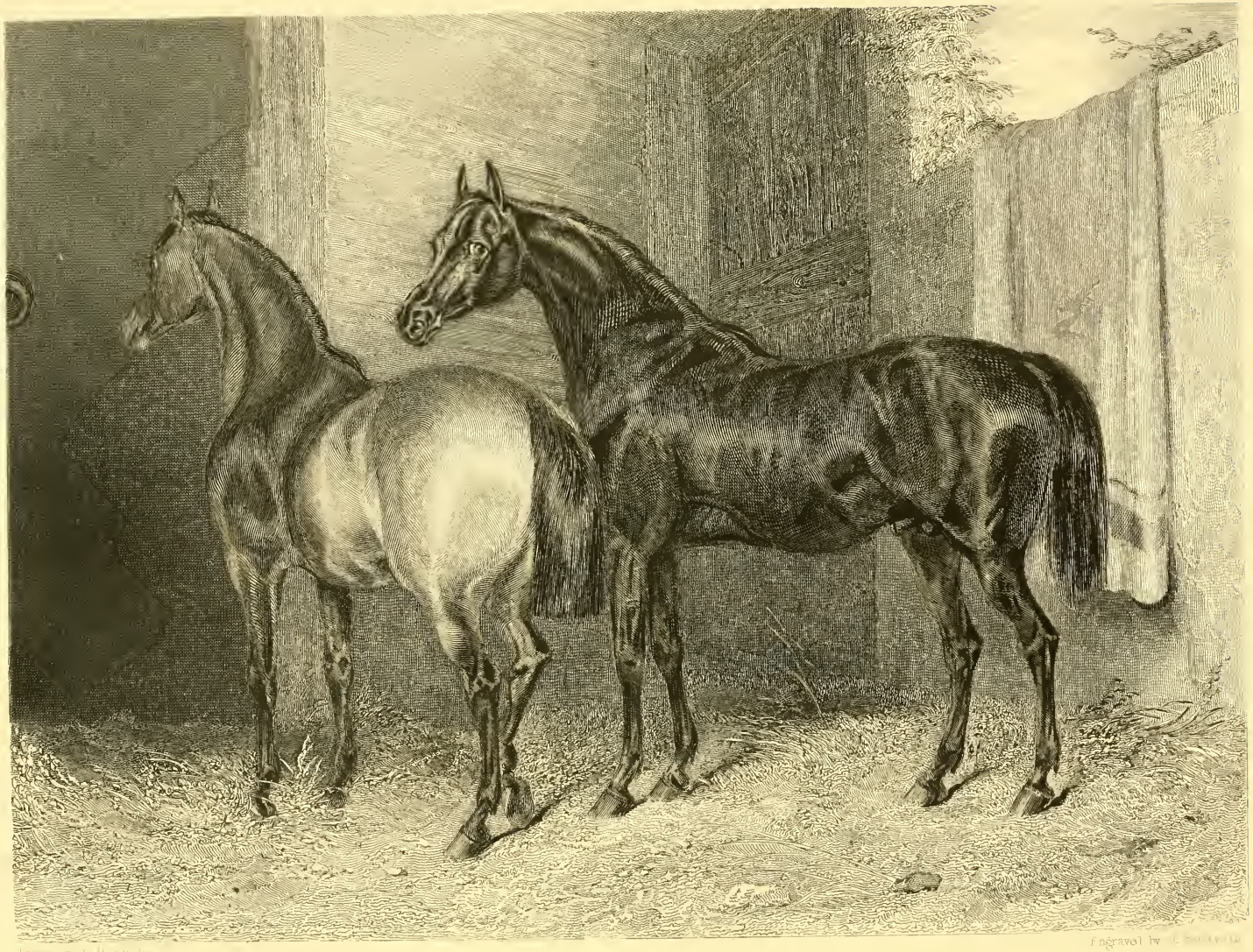

RURAL LIFE:

DESCRIBED AND ILLUSTRATED

IN THE MANAGEMENT OF

HORSES, DOGS, CATTLE, SHEEP, PIGS, POULTRY, &c.

THE REST IN THE GLEN.

DRAWN BY SIR EDWIN LANDSEER, R.A. ENGRAVED BY H. T. ANTHONY, FROM THE PAINTING BY SIR THOMAS LANDSEER.

THE C. NELSON PRINTING AND PUBLISHING COMPANY LIMITED

RURAL LIFE

Described and Illustrated,

IN THE MANAGEMENT OF

HORSES, DOGS, CATTLE, SHEEP, PIGS, POULTRY,

ETC., ETC. :

Their Treatment in Health and Disease;

WITH AUTHENTIC INFORMATION ON ALL THAT RELATES TO

MODERN FARMING, GARDENING, SHOOTING, ANGLING,

ETC., ETC.

BY JOHN SHERER, F.R.G.S.

AND A

COMPLETE SYSTEM OF MODERN VETERINARY PRACTICE.

ILLUSTRATED.

THE LONDON PRINTING AND PUBLISHING COMPANY, LIMITED,
LONDON AND NEW YORK.

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PREFACE.

Deferring to the opinion that the end of all writing ought to be instruction, the following pages have been produced with this end constantly in view: but as instruction may belong to the past, without, as well as within, the limits of existence allotted to man, the object in Rural Life has been to approximate as nearly as possible to the present, in order that, while we are in the land of the living, we may be participators in the enjoyment of the knowledge which, not only in Rural Life, but in every other condition, is daily developing itself around us. Thus, then, this Work has been produced in accordance with the approved principles of the most experienced, intelligent, scientific, and practical men of the present day, engaged in the pursuits of which its pages are the record; and the information it contains is brought down to the time of its publication.

Another end which has been kept in view in the production of Rural Life, is simplicity and clearness in the arrangement. This, it is believed, has been obtained, not only by laying the Work out in divisions, as a horticulturist does his ground, but in subdividing these into chapters, and these, again, into paragraphs, with, in many instances, separate or independent "headings." This, it is thought, has greatly tended to simplify its arrangement; to lighten any heaviness which might otherwise have appeared in some of its pages; to facilitate the desire of reference; and, altogether, to render Rural Life less wearisome in the perusal. As all pleasure consists in variety, the subjects have been disposed in such a manner as, it is hoped, will secure the reader, whilst seeking for information, from being baffled by confusion, or disgusted with dulness.

The veterinary portions may, by some, be considered of the first, and by others of the last, importance. But however this may be, they have been

carefully compiled, and not a single recipe given, except upon the authority of well-established practice. In treating such a subject as Farriery, a due degree of delicacy has been observed in the phraseology, but never to the sacrifice of perspicuity. He who would prevent, alleviate, or cure the maladies of brutes, must, in addressing those who may be ignorant of the scientific technicalities of language, be permitted some latitude of expression, in order that what he desires to be done, may be sufficiently understood by those on whom the duty of carrying out his recommendations is to devolve. To the other divisions of RURAL LIFE equal attention has been given; the principal object having been to reproduce, in as clear a form as possible, the most recent information on the various subjects of which it treats.

The ENGRAVINGS are by several of the highest animal artists of whose names this country can boast; and they have, as may readily be conceived, been produced at great expense. But that which is scarce and good must always command a price proportionate to its value. The original drawings from which the ENGRAVINGS have been made, being of a class in which excellence is rarely attained, they have been procured with a view to enhance the interest and value of RURAL LIFE; and it is hoped, that the laudableness and realisation of the desire, will secure the accomplishment of the end.

J. S.

London.

GENERAL INTRODUCTION.

Among the ancients, the literature of Agriculture occupied a far higher place than that to which it has attained in modern times; although, within these twenty years, Great Britain has made immense advances in the practical manipulations of the science. Mago, the Carthaginian, who is supposed to have flourished in the time of Darius, and to have been the founder of the great Punic family, from which Hannibal sprung, is declared to have been the father of agricultural literature. After him come Hesiod, Theophrastus, Xenophon, Cato, Varro, Virgil, Columella, Pliny, and Palladius—all of whom say something, more or less, of Agriculture. Among the writers on this science, if there were no great kings, there were certainly great generals. Columella tells us, that Mago, the Carthaginian, and Hamilcar, did not consider it beneath their dignity, when not engaged in the operations of war, to contribute, towards the general stock of human knowledge, treatises on farming. The books which Mago wrote on the subject amounted to twenty-eight, which were so highly esteemed, that, on the final destruction of Carthage, when the whole of her literature was handed over by the Romans to their African allies, these were specially excepted, carried to Rome, and ordered, by the senate, to be translated at the expense of the public. Such an honour proves the estimation in which his books were held; whilst it shows how deeply interested the Romans were in the subject of Agriculture. On neither Greek nor Carthaginian Agriculture, however, have we the means of gathering very much information. In reference to Greece, we know that Attica was arid, and Laconia full of swamps; that Megara was deformed with rocks; and that Corinth depended on foreign importations for her food-supply. But this is not telling us much; although she could not have been destitute of an agricultural literature, since Pliny laments the loss, in his day, of forty treatises upon the subject. The incidental notices of Herodotus and Thucydides do not yield us much information; and although we have the work of Theophrastus come down to us, it is not very satisfactory as a book on husbandry. The *Œconomics* of Xenophon are said to have been composed on a farm, which he had bought and occupied near Smyrna, and which is frequently appended to the *Memorabilia*. Farming, gardening, household management, and instructions relative to the government of wives, form the staple of its pages; and it contains the passage in which Cyrus the younger presents himself to Lysander in the character of "The Persian Farmer."

Passing from Greece to Rome, Cato the censor is the first distinguished personage that rises before us as an agricultural writer. He inherited from his father a Sabine farm, which he cultivated himself, but rather parsimoniously than otherwise. He was by no means an advocate for "high farming;" but preferred limiting his outlay to making active efforts at improvement. He died 150 years before the birth of Christ; and left room for Varro, one of Pompey's generals and admirals, to take his place in the list of writers on rural affairs. His work, entitled *De Re Rustica*, has descended

to us, and proves him to have been a practical farmer; although he chiefly relies upon the maxims of Mago, and some Greek writers, for the mode he pursued in cultivating the soil. He lived nearly throughout the century which immediately preceded the Christian era; and was, for some time, librarian both to Julius and Augustus Cæsar. Virgil comes next; for Cicero can hardly be included in the list. The *Georgics* are poems of great originality, embracing much smoothness of versification, and elegance of diction, with precise, ample, and sound directions for the husbandman. To him succeeds Columella, who was a native of Spain, and apparently born about the time of the Christian era. His work has come down to us almost entire, and is divided into twelve books. Two of these are on farming and farming premises; but also contain some directions on the selection and management of agricultural slaves: three on the vine, olive, and orchard fruits; two on farming and domestic animals, from which he excludes the sporting-d g; one on poultry; and one on bees. In the ninth book he breaks into verse on th- subject of gardening; and in three more books treats of the bailiff, his wife, wine, vinegar, jam-pots, and the kitchen garden. Pliny comes next. He died in A.D. 79, and was succeeded by Palladius, who wrote fourteen books of a farmer's calendar, and a poem on the art of grafting. He was a landed proprietor in Sardinia, and also near Naples. As an agricultural writer he is not very highly spoken of; although, in the middle ages, his work was held in considerable estimation.

The names we have thus given of the ancient writers on rural affairs, are spread over a period of eight centuries; and yet, throughout that long lapse of time, we look in vain for any sign of the science of Agriculture being considered a progressive art. There is not the smallest evidence of improvement. With the single exception of lucerne, there is no new object of culture introduced; and the system which the father unvaryingly pursued, seems to have been equally unvaryingly followed by the son. What were its characteristics is determined in a very few words—system, accuracy, carefulness, and a sharp eye against waste. The whole of the maxims of Cato have a tendency to the repression of outlay; and the consequence was, that the productive powers of their lands decreased, as the soil became exhausted from the frequency of the crops. What is called high farming—by which is meant a large expenditure, with a view to increase produce—was out of the question; and instead of looking forward with a view to the means of success, the Roman farmer seems rather to have possessed the faculty of looking backward, in order to preserve himself stationary in his position. This, of course, was fatal to advancement; and hence the dreary waste of his years, as well as of his lands, in the agricultural course he pursued. Under the division on farming, in the following pages, this subject is noticed in greater detail.

Of the system of farriery, as practised among the ancients, we possess very little knowledge. We have, occasionally, a slight notice from Columella, who treats at length on the general management of cattle; and in Renatus, who flourished a couple of centuries later, the subject of animal diseases is more elaborately handled. He urges the necessity of a high cultivation of the veterinary art, not only as being a source of pecuniary gain, but as being the means of enlarging our sympathies with the sufferings of the lower animals. With the exception of the necessarily crude and imperfect performances of these two writers on this subject, no ancient treatise, bearing directly on the diseases to which animals are subject, and composed by a professional man, has descended to us. There are no evidences whatever, in the writers just named, that they were acquainted with the sciences of anatomy and physiology—a circumstance

somewhat singular, as, both in Egypt and in Greece, considerable progress had been made in human and comparative anatomy. Among the ancients, Celsus is the only physician of celebrity who is said to have written on veterinary medicine; whilst Xenophon is the most ancient Greek writer who has specially written upon the horse. His performance, however, is confined to the training of the animal for war and the chase: it is supposed, however, that the ancients had a knowledge of the disease which is called the "glanders," and was known under the denomination of the "moist malady."

Whatever merit may be assigned to ancient writers on veterinary art, arises from the dietetic rules, and the works of domestic management they have bequeathed to us. In other respects they were but in their novitiate. They were powerful in the art of purging; but what they have left us on the symptoms of disease, has not tended to advance our knowledge; although it is an evidence that they were not inattentive observers, however far they failed in the application of the proper remedies. In bleeding they were as great as in purging; but whatever were their drawbacks, they were much superior, not only in learning and eloquence, but even in professional ability, to the vast majority of their pupils of the fifteenth, sixteenth, and seventeenth centuries. At these periods, the mental gloom, which had so long darkened the European continent, began to be dispelled, when, with the general dawn, the works of the ancient veterinary writers became objects of search and desire; and, as fast as they were found, they were translated into the Italian and the French languages. The art became a study. Ruini and others described, anatomically, the body of the horse; schools began to be established for professional instruction: and, notwithstanding the immense advantages which have arisen from the general diffusion of knowledge, the labours of these first teachers, after the revival of learning, must still be acknowledged with respect and gratitude. The medicinal part of veterinarianism was more generally cultivated, and, at least in some instances, under accredited medical professors. Every branch of the equine economy—whether as regards the harness or the trappings, equitation, the military *ménage*, or the riding of the horse; the methodical treatment of the hoof, accompanied with the invention of various forms of iron shoes, as well as their scientific adaptation to the foot—were eagerly pursued, and mostly with success. In the shoeing department, one Cæsar Fiaschi greatly distinguished himself; and either invented or recommended the welted shoe as a substitute for calkins and forknails, which were then in use. He is also said to have invented the *lunette*, a sort of short shoe in the shape of a half-moon, which, since his time, has met with favour from some of the faculty.

The new art having rapidly diffused itself over a large portion of the European continent, soon reached England, where the cure of diseased or injured animals had, from time immemorial, been given over to the tender mercies of leeches and farriers, whose ignorance generally was only rivalled by their inhumanity. In proof of this, an expression of Markham, a writer on the subject, is confirmative. "Other torments there are," says he, after expatiating upon *his* cures by the use of fire and the knife. It is probable that the future scintillations of knowledge, first received in this country, occurred in the days of the Tudors; as we learn from Blundeville, who wrote in the reign of Elizabeth, that French and German farriers were not only employed by the queen, but, in general, by the English nobility and gentry. Yet the progress of our practitioners was slow—possibly arising from the greater amount of countenance being given to the foreigners; but from the period of which we now speak, to that of the earlier

part of the eighteenth century, veterinarianism in England, like the lengthening chain of Goldsmith, only dragged its slow length along. No medical name of the smallest scientific pretensions appears on the veterinary list throughout that long, dreary interval in the medical, surgical, or anatomical branches of the art. To be sure, there is a person of the name of Snape, who *crops* up, and who was the farrier of Charles II. The family of this man, it appears from his book, had, for upwards of 200 years, served the crown in the capacity which, it is to be hoped, he himself worthily filled, as he seems to have been tolerably informed. His anatomical system, arrangements, and nomenclature, were a copy of the Italian school; but he was a dissector himself, and described from his own observations. Besides Snape, there are the names of Stephens, Martin, Clifford, and Morgan, all of whom are early writers on the veterinary art; but they are of no merit. Neither is the work of Mascal, the farrier of James I. This book is ludicrous in the extreme; and it may be taken as a significant sign of the ignorance of the age when he wrote in reference to farriery, that his book passed through numerous editions, notwithstanding that there were other national and even learned treatises on the same subject. It is difficult to account for this: but he was the *king's* farrier; and as there is something in position and a name even in these enlightened days, it is probable that there was a similar *something* in those of the Scotch Solomon who sat upon the English throne. To the above list may be added the names of De Gray and Gervase Markham, who continued to publish till after the Restoration. Markham's works have been said to comprise "every absurd, barbarous, and abominable juggling trick," as well as every useful invention which had, up to his time, issued from the brains of either ancients or moderns. Whatever may be the defects and deformities of the works of Markham, however, they had a rapid and widely-extended sale. They enjoyed a high reputation down to the days of Gibson; and even long afterwards were held in esteem among the country leeches and farriers. Fame of this sort is indicative of some merit. Mankind in general are slow to give praise where it is not justly due; and that which was conferred on the works of Markham, seems to have endured longer than that which was extended to preceding writers on the same subject. It is allowed that his work contains the amplest details of the practice of farriery as then in vogue, with delineations of the instruments in use, not very differently contrived from those employed in the practice of subsequent professors. As a specimen of the nonsense with which some of the writers on farriery disfigured their works, we may instance an example from Dr. Gray. In a case of *farcy*, this sage equine Esculapius orders the medicine to be administered to the *ears* of the horse, and drawn up therein. In a case of *lameness*, he orders a turf to be cut and secreted; and in proportion as the turf decays and wastes away, so shall the *lameness* of the animal gradually depart. Could folly go further? Yet men like these were the persons who took upon themselves the cure of the noblest of the lower race of animals, when unfortunately fallen ill or laid up by some injury, which, in all probability, nature herself would have cured, but for the officious *assistance* of these sagacious practitioners.

In the reign of Elizabeth, a person of the name of Blundeville wrote a fashionable treatise on the "Horse," based on the practice of the continent; and, in the following reign, Baret produced his *Hipponomie, or the Vineyard of Horsemanship*. In this work is discussed the relative branches, including the principles and practice of racing, and of that system of equitation peculiar to England. This is followed by a huge folio by the Duke of Newcastle, who enters into details upon the regular management of the horse,

according to the method of the continental schools. Yet whatever light had, as yet, been thrown upon the subject of veterinary art, down to the reign of George I., the medical care and treatment of horses, and other domestic animals, was confined entirely to the leeches, farriers, and cow doctors of the period. Such was the deplorable condition of this art down to the early part of the eighteenth century, when it attracted the attention of William Gibson, who had acted as an army surgeon in the wars of Queen Anne; and who, to a sound judgment, seems to have added the essentiality of practical knowledge. He was the first professional man who, in this country, made the attempt to improve the veterinary art; and, like all men of sense and observation, seems to have commenced in the right way. Reasoning analogically, he gave those, or similar, medicines which acted favourably on the human system, to such animals as were affected with the same or a similar class of diseases. His work on farriery forms an era in the annals of veterinary literature; and the fundamental parts of his system became the basis of a very superior practice. A second edition of his work appeared about the middle of the eighteenth century, when it was followed by another excellent work on the same subject, by Dr. Bracken, a physician of Lancaster. After him came Bartlet, a surgeon in Bow Street, Covent Garden, who was rather a compiler than an originator of the art. He, however, was the first to introduce the impracticable system of short-shoeing, which had, at that time, been practised in France by La Fosse, a farrier of considerable experience, and a great practical veterinary anatomist. As Bartlet had no pretensions to the art of horse-shoeing, he adopted the rules of La Fosse; and these, fanciful as they seem to have been, operated beneficially on the practice of England, as it then existed. The subject, however, was not suffered to rest here. A Mr. William Osmer, a surgeon and a sportsman, took it up, and published an excellent treatise on horse-shoeing, reducing the speculative rules of La Fosse to the standard of his own, and that of English experience generally. His book proved of great usefulness; and being written in a plain and popular style, found its way into the hands of great numbers of the shoeing-smiths throughout the country. Those who had horses, and valued them, were now alive to the importance of the subject of horse-shoeing. The Earl of Pembroke wrote a treatise on it, and Berenger published a respectable work on the grand *ménage*. Clarke, then king's farrier for Scotland, issued a couple of superior treatises on shoeing, and on the prevention of diseases in horses; and the eighteenth century may be said to have become prolific in veterinary publications and practice. France took the lead in the movement; but a zeal for the improvement of this branch of science also pervaded Germany, and other continental states. Colleges were founded and established in various countries, in which the science has since continued to be regularly taught. A catalogue of the various continental writers on black cattle and sheep, was made and published in the *Giournal di Literati*, of Italy. Since that time, the writers on veterinary science on the continent have greatly increased, although comparatively few of them have found their way into this island through the medium of our language.

We have now arrived at 1792, when the Veterinary College, St. Pancras, London, was established for the treatment of the maladies of *all domestic animals*. At first, however, the institution did not flourish; but it gradually gained ground; and now, a much more widely-extended view of the benefits to be derived from its instructive modes of practice to all kinds of domestic animals, is receiving a more favourable recognition. A large number of valuable veterinary publications have issued from the press since the commencement of the present century; and these are still increasing.

The structure of the horse, the diseases to which he is subject, and the injuries to which he is continually exposed, have been investigated with the greatest success, not only in Great Britain, but in other countries. Associations have been formed, and colleges founded, for the advancement of veterinary science; and eminent practical professors are engaged in the dissemination of its principles; so that it has now taken a very elevated position. Its practice is no longer left in the hands of the uneducated and unskilful: the horse, the dog, and the beasts of the farm generally, are no longer subjected to the tortures of callous-hearted and presumptuous ignorance, but are placed under the care of gentlemen who have gained the general respect of the community, and the confidence of those with whom they come in immediate contact, and whose experience, intelligence, and humanity entitle them to the onerous position their profession calls upon them to fill.

As it is hardly possible to over-estimate the value of the Dog to mankind, a comprehensive, yet sufficiently full description of all the species of that animal, will be found in the division assigned to their treatment. In the most primitive ages, the dog was the follower and the friend of man; and so much has his wonderful sagacity, united to his physical qualities, excited the admiration of some nations, that they have even bowed the knee, and worshipped him. In the first books of the Scriptures he is frequently mentioned, but not as an animal which had taken its place among the wild beasts. He is spoken of as one which had become domesticated, and had already identified himself with the social attributes and idiosyncrasies of the lords of the creation. From the remotest times he was held in especial veneration by the Egyptians; was actually worshipped at Hermopolis the Great; and, shortly afterwards, in all the towns and cities of Egypt. Juvenal tells us, "that whole cities worship the dog (Anubis); no one Diana"—a lamentation in which, no doubt, numbers of his mythological countrymen would join. Subsequently, Cynopolis, the "city of the dog," was built in honour of that animal, and splendid festivals instituted in his honour. In the Greek mythology he plays a no less prominent part, and guards the gates of Hades in the form of Cerberus, with three heads, as being indicative of the extreme watchfulness of his character. The Persian fire-worshippers, like the Egyptians, paid him divine honours, and elected his shape to symbolise the Good Principle, which enabled them to baffle the powers of evil, when assailed by them. By the modern Parsees he is still held in high veneration. Leaving the East, and crossing the Atlantic for the West, we find it stated by De la Vega that the Peruvians formerly worshipped the dog; but it somewhat detracts from any spiritual character with which they may have thought him invested, when we are told that they fed upon his flesh at their festivals.

If these facts exhibit the profound superstition of the different nations of whom they are recorded, they also go far in proving the possession of qualities which, in this animal, entitles it to universal esteem. But it need not be a subject of wonder why the dog has always held such a high and honourable place in the affections of mankind, as it is his nature to participate in the general enjoyments, sports, pastimes, and even duties and cares of those with whom his lot is cast. Those who have given the slightest study to his habits, must have observed how soon he moulds his disposition to that of his master, or that of the family with whom he is taken into membership. If he should chance to be the property of a poacher or a ruffian, his character usually degenerates, as his nature invariably assimilates itself to that of his possessor. Like his master, he becomes a sort of lawless animal, surly, gross, and rude, and ready for any sort of rough

and terrible work that may fall in his way; but if he belong to a family in which order, regularity, gentleness, and good moral dispositions prevail, he is seldom other than an animal of great kindness and sociability. He becomes so tractable and docile that he really sometimes seems to know the character of the conversation which is being carried on; and by the silent attention with which he lies and listens, with open eyes, to conversation, one would almost believe that he understood the whole meaning of what was being said. We have had dogs by the score; and the last one we had possessed the peculiarity of frequently sitting before us, and, when we were reading, scanning our countenance for a quarter of an hour at a time, with a curiosity and an interest which no disciple of Lavater ever surpassed. He sometimes literally gazed us out of countenance, and must have profited wonderfully by his study, as he was a rare physiognomist; which, however, we think all sagacious dogs, more or less, are. The docility and intelligence of the dog, however, are in no situation witnessed to such a remarkable extent as when he has been thoroughly broken-in for the purposes of the sportsman in the field. Here he may be said to be, not only the companion, but the leader or director of his master; in every sense of the word, a real *pointer*, that, by his action and motions, indicates not only the direction, but *points* to the very spot where the game shall be found. The possession of the qualities requisite for a service of this kind naturally brings him into intimate relationship with our rural sports, more particularly those in which the gun takes a prominent part. This being the case, he has been, when opportunity occurred, introduced in the following pages, in the division assigned to SHOOTING; where, also, is introduced a condensed account of such birds and beasts as come under the denomination of *game*, which, in this country, confers upon them the privilege of legislative protection. In this division, a brief history of the gun is also given, down to such weapons as were exhibited in the International Exhibition of 1862; and, in order to complete this portion of the work, a description of the needle-gun—which may yet become a sporting instrument—so fatal to the Austrians in the late war, has also been given.

"He to whom an abode in the city lies close at heart, has no need of a country estate," is one of the maxims of Mago; but he may, for all that, take a lively interest in witnessing, in the field, the massive development of our bovine breeds. Accordingly a large division has been, in the following work, devoted to the description of such of our breeds of black cattle as have been brought to the highest state of perfection. The ancient Carthaginian just quoted made the form of the ox a study, and wrote upon the best means of preserving it in health. "Upon the health of black cattle," says Varro, "I have borrowed a good deal from the books of Mago, which I make my herdsmen carefully read." We like this. All agriculturists should follow the plan of Varro, and make their herdsmen peruse the best works on the management of cattle, sheep, and such animals as form the stock of a farm, and come more directly under their care and management. It may interest our readers to peruse the directions of Mago for buying oxen for the plough. The translation is from a minutely critical article in the *Quarterly Review*. "The young oxen which we buy should be square in their form; large limbed; with strong, lofty, and dark-coloured horns; broad and curly fronts; rough ears; black eyes and lips; prominent and expanded nostrils; long and brawny neck; ample dewlaps, pendant nearly to the knees; a wide chest, and large shoulders; roomy-bellied, with well-boned ribs; broad on the loin, with a straight, level, or even slightly depressed back; round buttocks; straight and firm legs, by no means weak in

the knees; large hoofs; very long and bushy tails; the body covered with thick short hair, of a red or tawny colour; and they should be very soft handlers." Oxen answering to this description would meet with favour even at the present day. As the subject of cattle, however, has been fully treated in the following pages, we will dismiss it here with the remark, that the live-stock of Great Britain are distinguished by the early period at which they become ready for the butcher; the enormous amount of food they yield in return for the provender they consume; and the great proportion of meat, of the finest quality, to be obtained from them.

With the general development and improvement of everything belonging to agricultural science, the SHEEP has come in for a large share of attention; accordingly, it is amply treated of in the division assigned to it. The various breeds are detailed; and the manner in which Mr. Bakewell, of Dishley, proceeded to found his celebrated Leicesters, has been, singularly enough, chosen by Archbishop Whately to illustrate a position in his treatise on *Logic*. To the scholastic mind, sheep and logic, brought into association by a reasoning archbishop, may sound somewhat strange; nevertheless, one portion of Bakewell's mode of proceeding is so clearly set forth by the archbishop, that we will make no apology for placing it before the reader. "He (Bakewell) observed, in a great number of individual beasts, a tendency to fatten readily; and in a great number of others, the absence of this constitution. In every individual of the former he observed a certain peculiar make, though they differed widely in size, colour, &c. Those of the latter description differed no less in various points, but agreed in being of a different make from the others. These facts were his data. * * * * His principal merit consisted in making the observations, and in so combining them as to abstract from each of a multitude of cases differing widely in many respects, the circumstances in which they all agreed." This, as the archbishop has stated it, was the secret of Bakewell's success. He chose the animals of the form and temperament which indicated the surest signs of producing fat and muscle; at the same time declaring, that all that was not beef in an ox was useless. Thus there was nothing like beef and mutton in the eyes of Robert Bakewell; and he himself seems to have been a pretty fair specimen of *his own* rearing, for he was tall, stout, broad-shouldered, and of a brown complexion; clothed in a brown loose coat, and scarlet waistcoat, leather breeches, and top-boots. In sheep, however, he regarded size as a vulgar test of merit; endeavouring to secure a circular body, with as short legs as possible; a small head; small neck and bones. It is well known that fat people are not generally large in bone. John Hunter, the great physiologist, confirmed, at least in one essential particular, the observations of Bakewell; for he affirmed that, in the human subjects he had examined, he found that small bones were the usual concomitant of corpulence.

The HOG has also received its full share of attention. Both the habits and appearance of this animal are calculated to excite, in a remarkable degree, feelings of disgust; yet it is an animal of immense value to mankind. It has emphatically been designated the poor man's friend; and there is no other which comes within the boundaries of the farm-yard more deserving of the distinction. Its flesh is, by tens of thousands, highly relished, in all the forms in which it can be put upon the table; and however unintelligent, stupid, stubborn, contrary, or perverse it may seem in its disposition, its docility has been frequently proved to be such as to excite general wonder. To its management in health, and its treatment in disease; to the various breeds which have extended its reputation; and to the care which is necessary to bring

it to the high state of perfection to which it is capable of attaining, a considerable portion of the following pages has been devoted.

Taking a comprehensive view of the subject of POULTRY, it will be found that, in an extensive collection, the geographical history and commercial progress of the civilised globe might, with no inconsiderable degree of certainty, be indicated. "Thus," says Mr. Richardson, "the peacock* represents India; the golden pheasant, and a tribe of ducks, China; the turkey (pride of our yard and table) is one of our many debts due to America; the black swan (rival of the snowy monarch of our lakes) reminds us of our Australian discoveries; while Canada and Egypt have each their goose. The large, fat, white ducks—models of what a duck should be—are triumphs of British breeding, and afford a specimen of one of the best productions of Buckinghamshire, since John Hampden. When, however, we turn to the fowl varieties, we find that Spain and Hamburg, Poland and Cochin China, Friesland and Bantam, Java and Negroland (besides our native Surrey, Sussex, Kent, Suffolk, and Lancashire), have each a cock to crow for them in our poultry-yards." It is further to be observed, that the same close attention to the proper kinds of food, warmth, and symmetry of form, which have built up to their present perfection our short-horned cattle, Leicester sheep, and thoroughbred horses, have similarly brought out the improving qualities of the fowl. It is thus that the elegant, though diminutive and spirited, Bantam has been produced; as well as the beautiful Spanish and Poland fowls. In 1826, when poultry shows were first established, with a view to draw a wider range of public attention to this branch of rural life, they extended into many parts of the kingdom; and, gradually increasing, they were, by 1860, so numerous, that there was hardly a district in England, of any consideration, but could boast of its society for the improvement of poultry. Even the Crystal Palace, at Sydenham, has had its shows of poultry, pigeons, and rabbits. This has not been without its advantages, as it has enabled agricultural visitors to London to compare what has been doing in the way of improving the lesser denizens of the farm-yard; whilst at the annual Smithfield cattle show they are enabled to note the development of meat and fat, and the diminution of offal and bone, in the more stately occupants of the stall and the meadow. What the last half century has done for cattle, sheep, and swine, a comparatively limited period has sufficed to effect for the several varieties of domestic poultry. The increase of size and weight of all classes of improved fowls, is now so much a matter of course, that, to secure prizes, they must combine with those essential requisites, high condition, quality, beauty of plumage, purity of race, and even uniformity in the markings, as well as in the size and form of the comb and wattles. To all these particulars due attention has been given in the division in which the treatment of poultry will be found.

A few years since, some Englishmen accepted an invitation from the French government, to cross the Channel with their best live-stock and implements, and enter

* At the siege of Lucknow, a touching incident occurred in connection with this beautiful bird. When the besieged were broken with sickness, sorrow, and comparative want, one day a bright-winged peacock lighted on one of the buildings of the beleaguered town, and attracted the eyes of many of the brave, though forlorn, inhabitants. How a taste of the fresh food of that bird would have been relished! Several muskets were presented at it; but, with an indescribable sense of humanity, they were lowered again, and the beautiful stranger was suffered to fly away uninjured. Yet, at that instant—

"Man's inhumanity to man"

was making countless thousands mourn.

into competition with the picked agricultural and mechanical skill of continental Europe. Arrived at the appointed spot, and the comparison made, it was found that they were almost immeasurably in advance of their neighbours in the arts and sciences necessary to the product of meat and corn in the most economical manner, although they worked under a climate not remarkable for its congeniality, and on a soil which has, for ages, been denuded of its virgin fertility. This must have been rather surprising, if not disheartening, to continental growers, breeders, and machinists; but the best evidence of the superiority of British live-stock, and agricultural machinery, is not to be proved by the medals awarded in Paris or Vienna, but in the constantly increasing exportation of both to all parts of the world where scientific cultivation has superseded the ruder modes of by-gone times. In regard to improvements, said the Earl of Carlisle, in addressing an agricultural meeting of Yorkshiremen, "I saw, on the plains of Troy, the clod-crusher of Crosskill; the drills, the horse-shoes of Garrett; and the ploughs of Howard and Ransome:" and, on the banks of the Danube, the Scheldt, and the Po; of the Mississippi and the Amazon; on the shores of the Baltic and the Black Sea; in Australia, and in Flanders (the cradle of modern agriculture), to English implements is given the same preference as that which is awarded them on the more classic ground of Troy. In so far as our own island is concerned, it has now, for some years, been proved, that the application of steam machinery to the cultivation of the soil, is, in many ways, preferable to the modes usually followed; and models of engines for the farm, which formerly appeared at our cattle shows, are now replaced by the machines, these represented in working order. This is the case at the Smithfield cattle shows, where the machines of several inventors are exhibited, accompanied with hundreds of testimonials, detailing the practical experience of those who have become purchasers, and who have given them a fair trial upon their own acres. The exhibition of these, united to the very extensive evidence in their favour, whether used on the churlish "clays," or the "lighter" soils, completely establish every essential point in the question of steam-power tillage. The saving of one-third of the farmer's teams, on a large holding, repays, in a few years, the prime cost of a steam plough; while two small farmers can join in the purchase of an apparatus too costly for one. The employment of several hundred machines in breaking up many thousands of acres in a single season, has demonstrated that the work is profitable, in point of economy, over horse labour; more profitable in the points of excellence and efficiency, and still more profitable in the point of augmented produce. From these circumstances, and the importance of the subject, a division has been devoted to the practice of modern FARMING and AGRICULTURAL MACHINERY, in order that the gentlemen who keep their own horses, farm their own estate, and *grow* their own beef and mutton, may have at hand a means of reference, in RURAL LIFE, to suggest such improvements as may arise from the perusal of its pages.

The cultivation of a garden was the only occupation of our first parents in Paradise; and from that hour to this, it has been considered, even by those whose position is such as to have placed one within the reach of their power, to be the purest of human enjoyments. "How did you endure your poverty?" asked Alexander the Great of Abdalonimus, a Sidonian prince, who had been reduced from a throne to earn his livelihood by cultivating a garden with his own hands. "May Heaven enable me to bear my prosperity as well! I then had no cares, and my own hand supplied all I required." In this condition he was independent; and independence

and contentment are greatness and happiness united. The practice of horticulture, no doubt, helped to occupy, at least, much of the leisure hours of the patriarchs. Homer's garden of Alcinous enjoyed an eternal summer; and the fruits it produced were the apple, the fig, the pomegranate, the pear, the olive, and the vine, watered by a couple of fountains, and encompassed by a hedge. Judging by the mythology of the Greeks, they must have been great admirers of gardens, as well as lovers of flowers and vegetables, as they sought to identify some of the most essential and beautiful products of the earth with the deities whom they worshipped. Thus, the oak was sacred to Jupiter, the maiden-hair to Pluto, the cypress to Narcissus, and the lily to Juno. Ceres had the poppy, Minerva the olive, and Venus the apple, the myrtle, and the rose. Flowers, in general, were supposed to have sprung from the tears of Aurora; while the trembling of a leaf, or the waving of a few blades of grass, indicated the passing of the breath of Zephyrus. All this is redolent of the fine imagination and delicious sweetness which characterised the taste of the old Greeks. The Romans, too, had their horti, both flower and kitchen; and the Piso, the Fabii, the Cicero, the Lentuli, and other distinguished names, are derived from ancestors celebrated for the successful cultivation of those vegetables to which these names were attached. The Britons, in the time of Strabo, had plots of ground combining the properties of a kitchen garden with those of an orchard; and, after the introduction of Christianity, A.D. 507, gardening was practised as an art congenial to the manners of the Saxons. Under the Danes horticulture continued to advance; and, on the establishment of the Normans in this country, we find various notices, not only of public, but of private gardens being attached to the dwellings of the people. In 1107, Brithnod, Abbot of Ely, flourished, and is spoken of as being an improver in gardening. "He performed a great and useful work," says the historian of his monastery: "being skilful in the art of planting and gardening, he laid out very extensive gardens and orchards, which he filled with a great variety of herbs, shrubs, and fruit trees." Notwithstanding this, however, it is questionable whether there was either taste or design in the disposition of his flowers, vegetables, and fruit trees; although we think it hardly conceivable, that a man could take delight in an occupation without evincing some principles of design in view, that it might give a greater zest to his pleasures. But be this as it may, it would appear that, before the reign of Elizabeth, the art of gardening was nothing more than a piece of mechanical routine. It had, so to speak, neither taken shape nor form; but was pursued as it had always been pursued—namely, without departure from the stereotyped modes of preceding horticulturists. The mighty and majestic Bess, however, had a great taste for flowers; and it was in her reign that the first regular establishment for the scientific cultivation of plants took place in England. Her successor was also a great patron of gardening; as was his son, Charles I., in whose reign the first glazed edifices for the preservation of tender plants were erected. All this, however, is described more at length in its proper place; as, also, is the most approved practice of horticulture in fashion at the present time.

In intimate association with fruits and flowers is the bee, an insect which has, perhaps, attracted more attention, and undergone more careful examination, than any other of the insect tribe. To this busy little creature it was deemed necessary to devote a brief division in the following work, that those who are in possession of a garden may gratify the natural desire of giving an occasional minute to watching the activity with which it seeks and dives into those flowers in which it finds the nectar upon which it

subsists, and the honey which it produces. For a very long period, the most diligent observers were totally at a loss to account for some circumstances in its history; therefore published to the world the most conflicting statements. At length, the Genevese naturalist, M. Huber, appeared; and, in a little work, published during the first decade of this century, he cleared away the difficulties. Many of the habits and instincts of the bee, unknown to our grandfathers, appear in the following pages.

Angling is a sport peculiarly congenial to the quiet of RURAL LIFE, and has found suitable treatment in its proper place. The salmon has not been largely dealt with, notwithstanding that those who favour the pastime, consider the capture of this fish by the rod as their noblest prize. When this monarch of the stream is hooked, nothing can be more exciting; and the enthusiast, after an hour of *terrible* anxiety and skill, who lands him fairly upon the bank, we verily believe would feel less glory in having a Roman triumph voted to him, than in surveying the fair and silver side of his beautiful captive, now stretched at length upon the green grass. For the delights of angling we have stores of literary authorities. From gossiping Isaac Walton, down to John Wilson, the Christopher North of the *Noctes Ambrosianæ* of *Blackwood*, we have the names of many literary lovers of the sport recorded. Even long before their day, the use of the rod was a delight to some of the lovers of literature. The great Raleigh, when banished from court, took to it as a recreation and a pleasure; and Archbishop Laud, in an epistle to Lord Strafford, in 1638, thus alludes to the salmon, when reposing from the cares of government, at his new residence in the woods of Wicklow:—"I find by your letters you are gone a hunting. I hope you will find time to go a fishing too; for I mean to be a very bold beggar, and desire you to send me some more of the dried fish (I do not know what you call it) which you sent me the last year. It was the best that ever I tasted." To this he adds—"Do not think to stop my mouth with more of your hung beef from Yorkshire, which was as hard as the very horn the old runt wore when she lived." It is supposed that the archbishop here alluded to salmon, preserved after the manner of the Scotch, who call it *kippered*. Cotton, the poet and voluptuary, occasionally fled from the world of gaiety in which he lived, to enjoy the pleasures of the rod: Davy left his laboratory; and even the ethical Paley quitted his desk and easy-chair, that he might enjoy some quiet hours by the stream, where meditation unites with silence to lead a man to thought and reflection.

Such is a brief *résumé* of the subjects treated in the following pages; and as information, rather than amusement, is their aim, it is hoped that the labour of producing them has not been spent in vain, but that their end will be accomplished.

JOHN SHERER.

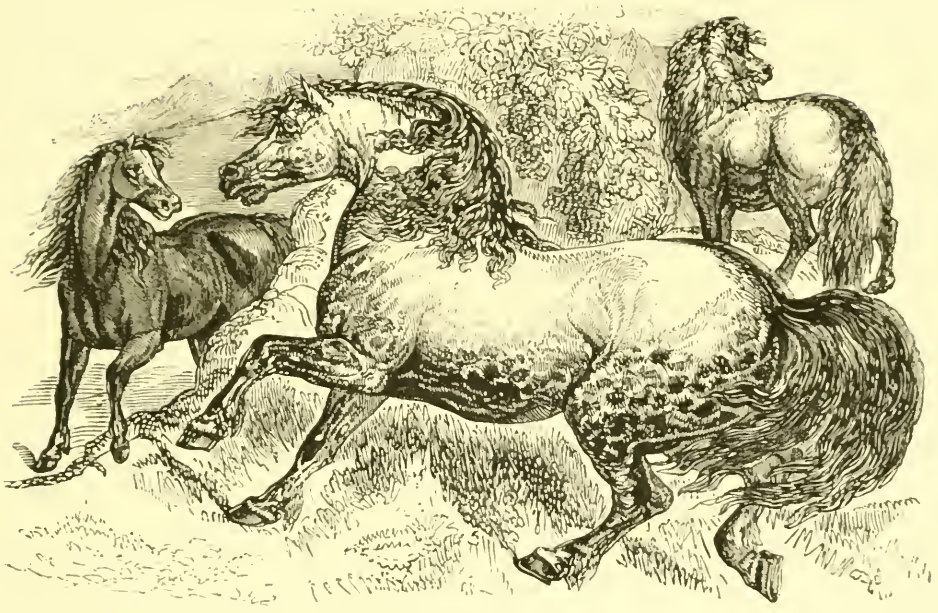
London.

RURAL LIFE

DESCRIBED AND ILLUSTRATED.

DIVISION I.

HORSES.



CHAPTER I.

THE EARLY AND ANCIENT HISTORY OF THE HORSE.

As it is impossible to ascertain, with any certainty, the original country of the Horse, it is, in a practical work of this kind, unnecessary to enter upon the discussion of the different theories which, upon this subject, have occupied the minds of naturalists, and which have resulted only in the maintenance of opposite opinions. Which was the country where the animal was first brought into a state of subjection, is another unsettled point. Colonel Hamilton Smith, notwithstanding his extensive researches, seems to have felt the difficulty of this one, and to have abandoned it in a sentence which appears to indicate a slight sentiment of despair at the futility of his labours. "We know," he says, in the twelfth volume of the *Naturalist's Library*, "so little of the primitive seat of civilisation, the original centre—perhaps in Bactria, in the higher valleys of the Oxus, or in Cashmere, whence knowledge radiated to China, India, and Egypt—that it may be surmised that the first domestication of the post-diluvian horse, was achieved in Central Asia, or commenced nearly simultaneously in several regions, where the wild animals of the horse

form existed."* Quitting, therefore, these regions of probability, we approach those of greater certainty when we enter upon the fields of the scientific geologist. Here, from discoveries that have, in almost every country of the habitable globe, been made, remains of the horse have been found imbedded in the strata of the earth, in juxta-position with those of other animals. In all the continents of the Old World, vestiges of his bony structure have been exhumed, mingled not only with those of animals which are, now, known to have had an antediluvian existence, but with those of the bear, the deer, the elephant, and the tiger, in every latitude between the extremes of climate. Geological researches in the New World have been attended with similar results; so that the supposition of Colonel Smith, that "the post-diluvian horse commenced nearly simultaneously in several regions," may, we think, be taken as a theory, which, at least, has probability to support it. There is hardly a district in Great Britain in which equine remains have not been discovered: and when we consider this almost universal distribution of the animal, and further consider his tractability and his adaptation to the manifold purposes for which he is used in a state of domestication, we behold a striking evidence of the beneficence of the Creator to man—"the quintessence of dust"—in placing, so readily, within his reach the noblest of quadrupeds, and amongst the most easy to be rendered subservient to his power.

"Fossil remains," says Colonel Smith, "of the horse have been found in nearly every part of the world. His teeth lie in the Polar ice, along with the bones of the Siberian mammoth; in the Himalaya mountains, with lost, and but recently ascertained, genera; in the caverns of Torquay, Ireland; and in one instance in Barbary, completely fossilised. His bones, accompanied with those of the elephant, rhinoceros, tiger, and hyena, rest by thousands in the caves of Cronstadt, in Sevron, at Argenteuil; with those of the mastadon in the Val d'Arno; and on the borders of the Rhine with the colossal urus. All the remains hitherto discovered, appear so perfectly similar in their conformation to the domesticated horse, that they can scarcely be ascribed to other species of the genus. From the commixture of their remains, there cannot be a doubt that they have existed together with several great pachydermata. But what is most deserving of attention is, that while all the other genera and species, found under the same conditions, have ceased to exist, or have removed to higher temperatures, the horse alone has remained to the present time, in the same regions, without, it would appear, any protracted interruption; since, from the circumstances which manifest deposits to be of the earliest era, fragments of its skeleton continue to be traced upwards, in successive formations, to the present superficial mould."

Commencing with the earliest period in which mention is made of the horse, we find, that in Judea, horses were, till the days of Solomon, very rare. The earliest indirect notice of him is in the book of Genesis, xxxvi. 24; where it is said of Anah, the son of Zibeon, that he found mules in the wilderness, as he was feeding the asses of his father. The mule being the offspring of the ass and the horse, it is evident that wild horses, at all events, had then an existence in the wilderness of Idumea or Seir, which is the spot to which reference is made. The earliest direct evidence of the existence of the animal, is in Genesis xlvii. 17, where Joseph is said to have given the Egyptians "bread in exchange

* If Eastern tradition is to be considered of any value, Armenia—the mountainous region of the Minni—ought to be viewed as the region where the first post-diluvian horses were located. This country lies at the eastern extremity of Asia Minor, occupying an extent of about 300 miles from north to south, and about 430 from east to west. As it lies on the borders of the Caucasus and Mount Taurus, it is extremely mountainous, which would render it unfavourable for the breeding of large numbers of horses; but it has numerous plains and valleys, although of greater elevation than those of southern and western Asia. In the east it is highly fertile, and is the original country whence some of our finest fruits have come, such as the apricot and the plum. In the warmer districts, almonds, figs, and pomegranates are cultivated; and here, according to tradition, Noah and his family settled on leaving the Ark. It is now divided into fifteen provinces; the central one of which is called Ararat, where rises the mountain of the same name, on the summit of which the Ark rested after the Deluge. In Armenia and Persia, it is still designated the Kuhi Nūh—the Mountain of Noah. As horses, no doubt, formed a portion of the live-stock of the patriarch, here the first post-diluvian pair must have been located, to be in accordance with the Oriental tradition, which, even down to our own time, prevails in Armenia.—ED.

for their horses." In the very minutely detailed enumeration of the cattle stores of Abraham, Isaac, Esau, Laban, Job, &c., though there is a superabundance of other quadruped property, no mention whatever is made of horses. Neither in the fourth or tenth commandments are horses noticed with the other working animals. In the enumeration, however, of the Egyptian cattle property affected by the murrain, they are mentioned in precedence of the rest: "Behold the hand of the Lord is upon thy cattle which is in the field, *upon the horses*, upon the asses, upon the camels, upon the oxen, and upon the sheep."

In Deuteronomy, chap. xvii. 16, Moses forbids the Israelites, in the event of their electing from among themselves a king, to allow him "to multiply to himself horses," and thereby foster a lust of dominion and belligerent propensities; at the same time also creating, what the Lawgiver wished much to prevent—too frequent a communication with Egypt. In the Psalms of David, we find—

> "A horse for preservation is
> But a deceitful thing."—Psalm xxxiii. 17.

And in Eccles. x. 7, "I have seen servants on horses." Of Dan, Jacob says, on his death-bed, that, "he shall be a serpent by the way, an adder in the path, that biteth the horse's heels, so that his rider shall fall backwards." By this time, it is evident that the horse is now tamed and reduced to perfect subjection, for he is ridden.

From whatever country the horse was derived, Egypt was undoubtedly, in the most early times, his great breeding-place. The Old Testament proves this by many references; and Colonel Smith says, that to "Egypt we appear to be indebted for the first systematic attention for reviving and improving the breeds of horses. Numerous carved or outlined pictures represent steeds, whose symmetry, beauty, and colour, attest that they are designed for high-bred types." At Jacob's funeral in Judea, there came forth, from Egypt, "chariots and horsemen a very great company." The Hebrews were pursued into the Red Sea by Egyptian horsemen; horse and rider being there overwhelmed: and Pharaoh "took 600 chosen chariots, and all the horses and chariots of Egypt, and all the horsemen, and pursued the Israelites to the Red Sea." Solomon, several centuries afterwards, obtained all his horses from Egypt. This monarch had 1,400 chariots, and 12,000 cavalry, and stalling for 40,000 horses. With this testimony, the account given by the Greek writers concurs. According to them, Sesostris (or Sesonchosis, as others write his name) was the first who taught men to tame horses and to ride them.* In Solomon's days, the price of a single horse from Egypt was 150 shekels, which, according to Bishop Cumberland's calculation of the shekel, is about £17 10*s.* of our money; a great sum in those times.

In this inquiry, the next in order, after the Egyptians, are the Assyrians, who became the celebrated cavaliers of the ancient world. These people are repeatedly alluded to by the Jewish prophets, not only as excelling in the beauty of their horses, and the skill of their horsemen, but also in all the showy ornaments of equestrian garniture. Their proficiency, however, in this branch of art, did not take place till long after the Egyptians had invented it, and attained to some degree of excellence in its manipulation. Then the Medes, Assyrians, and Persians, being possessed of more gold and silver than the Egyptians, decked and bespangled the animals they rode, with blue, with purple, and with gold. Persia latterly became most renowned for its horse-riding, and clothed its horsemen most gorgeously. Xenophon says, however, that, before the age of Cyrus, that country had, from its want of wealth, or its mountainous character, no horses; but that, after his time, from the personal example, encouragements, and recommendations of their king, every man in Persia rode on horseback.†

* The achievements of this monarch are supposed to have been the labours of several kings, attributed by Egyptian priests to Sesostris alone, whose very existence is a matter of doubt. Be this as it may, however, there is no date, perhaps, in the whole range of profane chronology, more disputed than that of the age in which he is said to have ascended the throne. Various epochs have been assigned, with a difference between them of nearly 600 years: 1618, 1308, and 972 B.C., have all been given as the periods of his rule.—ED.

† In the history of Cyrus, furnished by Xenophon, it is said that this sovereign was the son of Cambyses, king of Persia, by Mandana, the daughter of Astyages, king of the Medes. Conformably to the Persian educational curriculum, he was trained to endure every kind of privation, exposure to hardships, constant and laborious

So universal was this the practice, that it is understood that the very name of Persia, by which, ever afterwards, that country became known, was taken from PERESH—a word in Chaldee and Hebrew; signifying a horseman. Both in the plains of Assyria and Persia, vast numbers of horses were reared. We read in some authors, of no less than 150,000 feeding on one vast plain near the Caspian Gates. The ancient Persian horse was esteemed a gift of the highest value. Alexander the Great considered the present of one, the noblest that could be made. That this animal was one of great beauty, is unquestionable. Vegetius says—The Persian horses surpassed other horses in the pride and gracefulness of their paces, which were so soft and easy as to please and relieve, rather than fatigue the rider. Their pace, it seems, was as safe as it was pleasant; and when they were bred on a large scale, they constituted a considerable part of their owner's revenue. The Nysæan horses, which the kings of Persia used in their expeditions, were celebrated as the finest in the world.

About 500 years before the birth of Christ, Darius undertook his expedition against the Scythians—a people possessing neither towns nor fields, but living, like the modern Tartars, in movable camps, upon the milk and flesh of their numerous herds. The country of this people was nothing more than a rude waste, including, with Tartary, most of the present empire of Russia. They therefore had nothing valuable to lose with an enemy, because they had nothing to defend; and their force consisted entirely of *cavalry*. Here, then, in this barbarous region, the horse seems to have been completely subjugated, and to have formed the principal strength of the Tartars in repelling an invasion of their territory. Notwithstanding the excellence of the Persian cavalry, Darius was forced to retreat; and, before he reached the Danube, suffered great loss and hardship. When Xerxes, the succeeding Persian monarch, and son of Darius, invaded Greece, he had 80,000 horse; which, with his 1,700,000 foot, took him seven days and seven nights to cross the Hellespont. In northern Africa, in Mauritania, Libya, and Numidia, horses were numerous; but they are described as having been slightly made, and requiring little or no attention from their owners. Passing into Arabia, there is no mention whatever made by ancient writers of the horses of this country; and it was not till the later periods of the Jewish monarchy that they became numerous in Palestine. Indeed, generally speaking, Asia Minor had no ancient celebrity for its horses, with the exception of the country around Colophon, between Ephesus and Smyrna, where there was a strong and accomplished cavalry. This force was deemed invincible; and was frequently employed as mercenaries by other nations, when engaged in war.

Passing into Europe, we find that, in Greece, the art of riding the horse, and most probably the arrival of the animal himself, did not long precede the Trojan war. This country lies between the thirty-sixth and forty-first degrees of northern latitude, and is surrounded by seas, except upon the north, where it is bounded by Epirus and Macedonia. Its original inhabitants were Pelasgians, of whose origin but little is known, but whose tribes are supposed to have extensively settled in both Europe and Asia. The early inhabitants of Greece, however, are not so much to be distinguished by their respective localities as by their several tribes; for it is found, that as circumstances required, most, if not all of them, migrated from one place to another. The Pelasgi, however, chiefly occupied the Peloponnesus (now the Morea), from which they ramified into Thessaly and other parts. They

exercise, with the most simple habits and diet. Such an education was the very best to enable a man to become a subduer and trainer of horses. In his twelfth year, he accompanied his mother to the court of his grandfather Astyages, where everything was of the most luxurious description, calculated to enervate, effeminise, and deceive. But Cyrus resisted the temptations with which he was encompassed, and gained for himself the admiration of the sovereign and nobles of Media. When about sixteen, he accompanied his grandfather to the war against Evil-Merodach, the successor of Nebuchadnezzar, and regent of Babylon, who had wantonly invaded the territories of Astyages. In this war, his conduct was marked by such wisdom and valour, that he materially promoted the success which attended the Median army. After this, he returned to Persia, and remained with his father till he was forty years old, when he was recalled to Media, to undertake the military command under his uncle Cyaxares, who was only one year older than himself.—ED

were the most powerful of all the tribes, and were found in all parts of Greece. From this circumstance, the whole country was, at one time, called Pelasgia.

From a period previous to the Trojan war, Grecian fable has transmitted to posterity the story of the Centaurs—semi-human horses and semi-equine men, as Ovid calls them—which warrants the inference that horses had then first made their appearance in Thessaly, the most northern province of Greece—comprising an extensive vale of singular fertility, and encompassed on every side by the lofty ridges of Olympus, Ossa, Pelion, Æta, and Pindus. It was to the people of this country that the name Hellenes—afterwards adopted as the general designation of those whom we, from the Latin, call Greeks—was applied, and who early attained to great power. They must have enjoyed some degree of consideration before the Trojan war; for Chiron, their chief, was the preceptor of Achilles. They must also, however, have been ignorant of the picture represented by that of a man and a horse when engaged in the act of riding and being ridden; for, as the Mexicans did, when they first beheld the Spanish cavalry, the Thessalians fled, panic-stricken at the sight of the double-shaped, incomprehensible monster that charged them. This is the origin of those mythic absurdities which the genius of Greek sculpture has transmitted to future ages, chiselled, by the most accomplished art, upon their marble tablets. It is surmised that these Centaurs were a tribe of Pelasgi, or emigrants from Phrygia and the southern shores of the Euxine Sea, which were occupied, at an early period, by a colony of Egyptians, planted there by Sesostris in his Phrygian and Scythian expedition. Corroborative of this supposition is the Grecian tradition, recorded by antiquaries, that Phylere, the mother of the Centaurs, cohabited with Saturn in Philyreis, an island near the southern shore of the Euxine; and that, from that island, she emigrated to Thessaly and the mountains of the Pelasgi. Mr. Youatt, in his able treatise on the horse, offers another interpretation, by which the origin of these monsters may more naturally be accounted for. "The Thessalians," says he, "were the pride of the Grecian cavalry. Before the other provinces of Greece were scarcely acquainted with the name of the horse, their subjugation of him was so complete, that, in the language of Shakspeare—

> "'These gallants
> Had witchcraft in't—they grew into their seats;
> And to such wondrous doing brought their horse,
> As they had been incorpsed, and demi-natured
> With the brave beast.'"

This power of adhesion to the back of the horse, however extraordinary, and however astonishing to the Bard of Avon, has not been confined only to the ancients. Mr. Dunn, in his *History of the Oregon Territory*, and in his description of the Half-breeds of that country, lets us into the secret as to how this power is obtained, and how he has witnessed it exercised in North America. "The Half-breeds," says he, "are a well-informed race, and the men are remarkably ingenious, athletic, and vigorous. In horsemanship they are singularly adroit: nor is this to be wondered at; for, in fact, they have been trained from their extremest youth to the management of the horse, accompanying their parents generally in their trapping excursions on the plains and hills, on horseback. One of these practised 'Half-breeds' would receive applause from Alexander of Macedon himself, or the best-tutored equestrian at Astley's. He would mount the boldest and most high-mettled Bucephalus of the plains; give him full play over level and rough, high and low, river and hill, until he brought him back as tame as a mouse. The cleverest fellow of this school I ever saw, was Joseph McLoughlin,* a natural son of the present governor and a half-bred woman. He was a person of some little distinction from the accident of his birth, independently of his astonishing equestrian capabilities. In seeing his feats when managing a wild stallion that galloped and plunged to desperation—clinging to the animal as if he were an inseparable part of him; playfully tossing his bare head over the upreared head of the horse; while his breech clung to his back with the tenacity of wax, and his heels seemed glued to his ribs, with his hands fastened in his mane—he completely explained to me the fabulous stories of the Centaurs; for I at once saw that there was some ground for the old fictions of poets and painters in drawing a compound animal, man and horse."

* The name seems to denote either Irish or Scotch origin.

Continuing our history regarding the probable migrations of the horse, we might trace, even from the few data afforded by history, his circuit, with the consequent art of equestrian exercise, from Egypt (the original and central riding-school of the world), into Greece and into Europe. His probable route, however, was from Egypt into Assyria and Persia; from Assyria to Cappadocia, Amazonia, and Pontus; which, on the river Thermoden, was also the residence of the Amazons. In these countries horses were most reared and most admired; and holding the highest position among the lower species of animated nature, they were offered up as sacrifices to the sun. From Pontus they passed, with the streams of westward-rushing population, to Phrygia and the southern banks of the Propontis; and thence, with "horse-taming" Pelops and the Pelasgi, they migrated into Thessaly, where, as already observed, with their novel and terrifying appearance, they confounded the simple aboriginal inhabitants.

Even at the time of the Trojan war (1192 B.C.), it is believed that horses were but rare animals in Greece, and were possessed only by princes or great men, who kept them more for the purposes of display and chariot-drawing, than for use. In the *Iliad* there are only two references made to horse-riding, and but one in the *Odyssey*. The first is where Ulyssus and Diomed capture the horses of Rhesus, and ride them into the Grecian camp. The second is where a horseman is exhibited as riding on four fair coursers, and performing some of the feats which were the common stock of Astleyan representations on the south side of Westminster-bridge. In the *Odyssey* the reference is made in the form of a simile, which compares Ulyssus, after his shipwreck, bestriding a beam of wood, to the resemblance of a man astride on horseback.

In these ancient times, the art of shoeing the horse with iron had not been discovered; so that a strong hoof, "hard as brass," and solid "as the flint," was reckoned one of the good qualities of a steed. In Oriental countries, the dryness of the roads rendered this fortification of the hoof less necessary; and the muddy ways, and miriness of the ground's surface in the north of Europe, we suppose, first caused and confirmed the practice. Hannibal's cavalry, however, lost all their hoofs in the miry and embarrassing march through the marshy ground between Trebia and Fesulæ. To prevent injury to the hoof, from its contact with the flinty high-roads, it became the practice of both Greeks and Romans to attach to it a sort of sandal, made of sedges or of leather. This original shoe was sometimes further strengthened, by having plates of iron attached to it; and was sometimes adorned with silver and gold, as we read of in the cases of the horses of Poppæa and Nero.

Neither did the ancients make use of saddles or stirrups; and the Numidian horses had even no bridles, although their armour and their trappings, in so far as appearance went, must have compensated for these deficiencies by their gorgeous and extraordinary splendour. On the fresco representations of the Parthenon at Athens, neither the bridle nor the saddle is introduced upon the horse, nor has the rider any other instrument to guide him but a small switch or stick. Referring to this circumstance, Berenger remarks, that it may, in some degree, be difficult to conceive how a switch or stick could be sufficient to guide or control a spirited or obstinate horse in the violence of his course or the tumult of battle; but the attention, docility, and memory of this animal are such, that it is hard to say to what degree of obedience he may not be reduced. There is no reason why these horses may not be brought to understand the intention, and obey the will of their riders with as much certainty and readiness as our cart-horses in our crowded streets attend to the voices of their drivers, by which they are almost solely governed. Managing the horse without the use of bridle or spur, indicates the perfect subjection to which the animal had been brought by Grecian training; for it would seem that the gentlest touch of the rider was sufficient for him to be guided in accordance with the will of his master. By a touch on the muzzle he was stopped, and by a touch of the heel he was urged forward. The cruel inventions of the bit and the spur had not yet suggested themselves to the ingenuity of mankind. Yet the obedience of the horse would seem to have then been as complete as the appliances of a confessedly more advanced period of

civilisation in the arts could make it. At a later period, we find both the bit and the bridle introduced into Grecian sculptures. Neptune made the Romans first to teach "with bits the generous horse to tame." The saddle is a comparatively modern invention; and we have no notice of the stirrup until about the middle of the 12th century of the Christian era. It, however, was in use a century prior to this period; for, in the Bayeux tapestry, which was the work of the wife of William the Conqueror, the figure of a horse appears, with saddle, bridle, and stirrups. The more ancient heroes made no use of artificial means for the purpose of mounting their steeds. Their agility enabled them to fling themselves upon the backs of their animals with the utmost ease; but those who fought on horseback with the lance or spear, usually had a loop or a cord depending about two feet from the bottom of the shaft, or a small projection on the shaft itself, by either of which they could assist themselves into their seats if necessary. The horse was sometimes trained to kneel, when his rider was going to mount him; and, as ease and effeminacy further impaired the agility of men, short ladders came into use for the purpose of *scaling* their horses' backs. Great men had their slaves to assist them both to mount and dismount; and, subsequently, that all who rode might be accommodated with the means of easily getting upon their horses in situations where other sorts of assistance could not be procured, the local magistrates of both Greece and Rome had proper stepping-stones set up, at convenient distances along the roads. In earlier times, however, it was not as a ridden, but as a war-chariot animal, or as an animal for show, that the horse was principally used. Subsequently his speed came to be publicly tested in competing for the prize at the Olympic games, founded in honour of Jupiter. Here, in the chariot races, his qualities were put to a severe test. The Olympian festival was instituted 776 years before Christ; and consisted of sacrifices to Jupiter and Hercules, and in the exhibition of contests to their honour. Every fourth year was the period appointed for the recurrence of the celebration, and an olive garland was the only prize of victory in the different exercises. This, however, became a distinction greatly envied; and the interest taken in the contests, coupled with the sanctity and splendour of the religious ceremonies, brought together an immense concourse of spectators, and distinguished it beyond all the other institutions of a similar kind established in Greece. Not till the twenty-third Olympiad was the horse introduced into the contest; and not till the twenty-fifth as a chariot-racer. The description of the chariot-racing is thus given by Mr. Youatt:—

"The chariots were arranged abreast of each other at the starting-post—for it will appear that these gave some important advantages—having been previously decided by lot. An altar was erected on one side, upon which stood a brazen eagle, dedicated to Jupiter, and a dolphin sacred to Neptune. At a signal from the presiding officer, the eagle, by some mechanism, sprang into the air; the dolphin sank under the ground, and away the horses started. The hippodrome, or course, was about one-third of a mile in length; and at the further end was a pillar, round which the chariots were to be driven, and back again to the starting-place, six times—making rather more than four miles

"The rounding of this pillar was the first test of the skill of the driver and the docility of the horses, and many an accident happened there. This dangerous spot was no sooner passed, than the competitors came at once upon a strange figure, placed to try the courage and nerve of the horses. It was an enormous statue, called Taraxippus, the terrifier of the horses; and, according to old writers, well worthy of the name. None of them describe this strange deity; but all agree that he used sadly to frighten the steeds, and often to endanger their lives, and also the life of the driver

"A little further on was a lofty rock, in the very centre of the course, leaving only a very narrow defile, in the passing through which the skill of the charioteer was severely tried; while several men placed on the rock, increased the confusion and the terror of the horses, by the continual braying of their trumpets.

"As may be well supposed, the number of the competitors was much diminished ere the conclusion of the race. Some ran against the

pillar; others were frightened out of the course by the horrible statue; and not a few were wrecked on that fearful rock. Some were destroyed on the spot; others who escaped without serious injury, were derided by the spectators on account of their want of skill; and the fragments with which the course was covered, rendered almost every step perilous."

The conqueror in such a race, says Pausanias, well deserved the crown which he received, and the honours which were bestowed upon him.

The moral as well as the physical characteristics of the horse, have, from the earliest times, formed the subjects of poetical admiration and enthusiasm. This is especially the case when he is viewed as mingling, undismayed, in the heat of the fray—pawing the ground, distending his nostrils, dilating his eyes, and erecting his ears when he hears the braying of the trumpet, or the clashing of arms at no great distance from where he is standing. As the war-steed alone, he is thus sublimely depicted in the Book of Job:—"Hast thou given the horse strength? Hast thou clothed his neck with his beautiful mane? Canst thou make him afraid as the grasshopper? The glory of his nostrils is terrible. He paweth in the valley, and rejoiceth in his strength. He goeth on to meet the armed men. He mocketh at fear, and is not affrighted. Neither turneth he his back from the sword. The quiver rattleth against him, the glittering spear and the shield. He swalloweth the ground with fierceness and rage: neither believeth he that it is the sound of the trumpet. He sayeth among the trumpets ha! ha! and he smelleth the battle afar off, the thunder of the captains and the shoutings."

Job was an inhabitant of that country from which our English breed has been so much improved by the importation of horses from the desert; and this description of the animal, under the influence of a noble excitement, is not less remarkable for its accuracy than for its lofty poetical tone. In the nineteenth verse of the Scriptures, the Hebrew word is translated as signifying "thunder;" but it also signifies the mane of the horse. Accordingly, we have substituted the natural feature of the animal for the hyperbolical and unmeaning attribute of "thunder," with which his neck is said to be clothed, but which is quite inappropriate, if not altogether absurd, in the significance of its application.

In estimating the qualities necessary for war-horses, much depends upon natural disposition. Those of a fretful temper being proverbially soft, and not generally to be depended upon, would be ill-suited for the "tented field;" and this does not seem to have escaped the observation of our greatest of dramatists. Such horses are made by him to symbolise false friends. Thus he makes Julius Cæsar exclaim—

> "Hollow men, like horses, not at hand,
> Make gallant show, and *promise* of their mettle;
> But when they should endure the bloody spur,
> They fall their crest, and, like deceitful jades,
> Sink in the trial."

Homer, on the other hand, always speaks of the horse with admiration, and considers him as by nature invested with great dignity. In his conception, an additional respectability is conferred, even upon his princes and his war-grooms, by the titles which he bestows upon them of "horse-tamers" and "horse-whippers"—epithets which, however honourable in days of remote antiquity, are, in ours, associated only with the persons and the mean employments of grooms of the stable and horse-jockeys. It was the practice of ancient poets, as well as of people generally, to dilate upon the beauty and majesty of their horses; to invest them with attributes of the loftiest description, and to place them in situations in accordance with these high ideas. In this, it must be confessed they were, to a great extent, justified, not only by the noble shape and gallant appearance of the animal, but by his singular disposition, and, consequently, high price; his being the friend and, as it were, the attendant of princes; the terrible, yet graceful, accompaniment of war; and never seen, as in modern times, degraded to the familiar, yet far more useful purposes of draught in our streets, and husbandry in our fields. In Grecian fable, as well as in Grecian mythology, he is also represented in the most imposing situations and attitudes. Proserpine is carried off by Plautus in a chariot drawn by four horses. Neptune, swift as light, strikes the earth with his trident, and the first-born horse rushes forth from its centre. Aurora ushers in the light of the

morning by being represented as drawn by four milk-white horses in a rose-coloured chariot. These are all striking evidences of the might and majesty possessed by the horse in the Grecian mind, and of the noble purposes for which they believed him to have been ordained. The chariot of the Sun is, in Ovid's beautiful fable of Phaeton, drawn by grey-footed steeds; and Erechonius, a prince, is by profession, a horse-breaker. In the third Georgic of Virgil, his wonderful performances are thus immortalised:—

"Bold Erechonius was the first who joined
Four horses for the rapid race design'd,
And o'er the dusty wheels presiding sat:
The Lapithæ to chariots add the state
Of bits and bridles; taught the steed to bound,
To run the ring, and trace the airy ground;
To stop, to fly, the rules of war to know,
T'obey the rider, and to dare the foe."

A modern reader, therefore, must enter somewhat into the sentiments and feelings of antiquity, in order to perceive the beauty or propriety of Theocritus's comparison of Helen to a horse, or of Solomon's likening his love "to a company of horses in Pharaoh's chariots." The light in which the horse is thus considered as an ornament of royalty, or an appendage of war—not only ornamental, but efficient—is explanatory of many passages scattered over the pages of the Old Testament, and of those of the Greek and Latin Classics.

In the days of Xenophon, 600 years later than those of Solomon, the price of a good horse was about 50 danks, or £27 12*s.*; at least, such was the price paid by Senthes, the Thracian, to Xenophon, for the steed whereon he rode during his retreat from Babylon. As this general was a skilful horseman, as well as a good judge of a horse, it is interesting to see the opinions which, in his age, prevailed respecting the points of that animal.

"The first thing which ought to be looked at," says he, "is the foot; for as a house would be of no use, though all the upper parts of it were beautiful, if the lesser parts of it had not a proper foundation—so a horse would not be of any use in war if he had tender feet, even though he should have all other good qualities; for his good qualities could not be made any valuable use of. Thick hoofs make a horse's foot better than thin ones; and it must not be forgotten to see whether the hoofs are high or low, and near the ground both before and behind. The pasterns, or bones immediately above the hoofs and below the fetlocks, ought not to be straight like those of a goat, for this would shake the rider; and such legs are more subject to inflammation: nor ought these bones to be too low, for the fetlock would be chafed and ulcerated if the horse were ridden over ploughed grounds or among stones. The bones of the legs, being the supporters of the whole body, ought to be large; not, however, too thick with veins. The thighs, under the shoulders, are both strong and graceful when they are large; and when the chest is also large, it greatly contributes, not only to the beauty and strength of the horse, but to his being able to continue a long time in one pace. The neck should proceed from the chest, and it should be free about the bend of the head, which should have a small cheek. The eyes should stand well out; the nostrils be wide, and the ears small. The loins should be broad and short; the haunches large and fleshy, and such as to correspond with the sides and chest of the animal."

Such is the description of Xenophon; to which we may add that of Blundeville, who thus speaks of the Greek horses:—"The horses of Greece have good legs, great bodies, comely heads, and are of a high stature; and very well made forward, but not backward, because they are pyn-buttocked. Notwithstanding, they are very swift, and of a bold courage. But of all the races in Greece, both the horses and mares of Thessaly, for their beauty, bigness, bounty, and courage, of all authors, are most celebrated. For which cause, Xerxes, on his coming into Greece, made a running of horses in chariots, to be proclaimed only in Thessaly, because he would have his own horses to run with the best horses in Greece. Julius Cæsar, being dictator of Rome, knowing the courage of these horses, was the first that ordained them as a spectacle before the people, to fight with wild bulls, and to kill them."

After the Greeks, the Romans followed pretty much in the same path, in reference to the management of the horse. Chariot and horse-races were, at an early period, introduced among them; and down to the reigns of

the Cæsars, the young men belonging to the equestrian order were enthusiastically devoted to horsemanship. They performed, in the field, similar feats to those which the modern exhibitor executes in the circus-ring: vaulting off and on; picking up things from the ground; stretching themselves on the backs of the animals; standing upright; and leaping from one horse to another, were amongst their favourite exercises. This people invented the curb bit, and were the first to employ veterinary surgeons to attend their horses. To each of their legions horse-surgeons were attached. But after the overthrow of the empire in the fifth century, we lose all trace of any progress having been made in the management and treatment of the horse, whether in a state of health or disease.

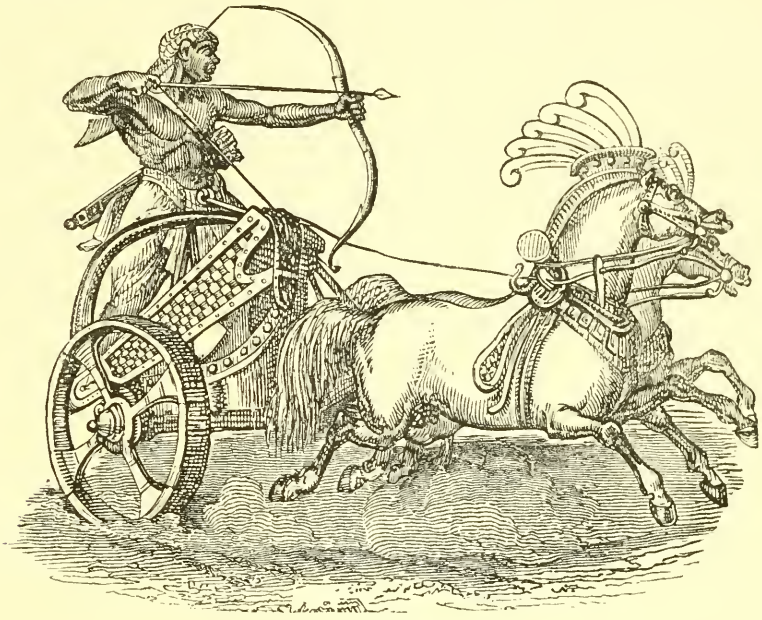
CHAPTER II.

HORSES OF DIFFERENT COUNTRIES.

THE HORSE OF EGYPT.

Egypt being the country where, it is generally supposed, the horse was first reclaimed, necessarily takes priority in treating of the different breeds of that animal as described by travellers and others, who have had opportunities of making observations upon their forms, and testing their qualities in their native climates. This country was, in the earliest ages, distinguished by its culture, and has a length of about 600 miles, with a varying width. From Syene to Cairo, a distance of about 500 miles, its great valley is about eight miles in breadth; while, in the Delta, it widens, and adds to the extent of the country about ninety or a hundred miles. It has two great divisions, named Lower and Upper Egypt. The first comprises that portion of territory which lies between Cairo, the Mediterranean Sea, the Isthmus of Suez, and the Libyan Desert, on the north, and has Grand Cairo for its capital. The second extends from Cairo to Assouan, or Syene, and holds within its area the ruins of ancient Thebes and Dendera. The river Nile is the special glory of this country, watering and fertilising it to an extent which makes it, even at the present time, as fruitful as it was in that of Joseph—"There is corn in Egypt," having become a proverbial expression to denote plenty. This river rises in Abyssinia, traverses Nubia and Egypt, and, after a course of about 2,000 miles, enters the Mediterranean. Like most of the African rivers within the tropics, it annually overflows its banks; and thus, in a land where rain seldom or ever falls, fulfils all the purposes which a luxuriant vegetation demands for the promotion of its growth. The rise commences about the 17th of June, or near the summer solstice: by the middle of August it reaches half its greatest height; and, towards the end of September, attains its maximum, when the waters begin to subside. The fields, on which a rich sediment has been left, are then sown with all sorts of grain; and, in an amazing short space of time, the face of the whole country is variegated with plants of every hue, and with the rapidly-ripening corn. As the fertility of the country may be said almost entirely to depend upon the inundations of the river, their progress is anxiously watched and measured by a pillar, called a Nilometer. This instrument consists of a thin column or pillar, placed about the middle of the river, on the point of an island called Rhoda, between Cairo and Geeza. It has twenty divisions of twenty-two inches each; and its height is thirty-six feet eight inches. When the river has risen to the proper height, all the canals connected with the Nile are opened, and the whole country laid under water.

The domestication of the horse, in this country, took place very early; and as he was then used principally as a war animal, or perhaps for the ornamental purposes of a state pageant, he must have been well kept and properly attended.



EGYPTIAN WAR CHARIOT.

The modern animal, however, has immensely degenerated. He is no longer the noble quadruped which the poet delighted to describe as the companion of princes; yet, under the vigorous government of Mehemet Ali, in 1821, a veterinary school was established at Abou-Zabel, of which we have an account in the 7th volume of the *Veterinarian*. The degeneracy of the Egyptian horse arose chiefly from the oppressive system which the Turks long pursued, in forcibly taking from the population any valuable animals they happened to have, and appropriating them themselves, without giving, in return, the slightest remuneration. Mr. Wilson—speaking of the corps of the Mamelukes, the body-guard of the Bey—in his *Expedition to Egypt*, says—"Although these horses seldom pass out of a foot-pace, except for a gallop of a hundred yards, most of them are foundered; and none, if quickly trotted ten miles, would be able, from want of wind and stamina, to go further." The shape of the animal, too, is neither prepossessing nor engaging. Burchardt says that he is ugly and coarse, bearing a stronger resemblance to the cart-horse than to the racer. He is frequently to be found with a short thick neck, and thin legs and knees. His head is, occasionally, fine; but the same writer declares that he never saw good legs in an Egyptian horse. Nor are the race capable of bearing much fatigue in any situation; but they are possessed of impetuosity sufficient to render them very desirable as cavalry horses; and it is upon this quality alone, that any celebrity which they enjoy is founded.

The physical features of Egypt are by no means unfavourable to the production of a beautiful breed of horses. The country consists mostly of a long and narrow vale, on each side of the Nile; bounded by parallel ridges of hills and mountains, and covered with a rich vegetation, in the highest degree congenial to the nature of the horse. The Delta—lying between the two extreme branches of the Nile and the sea, and taking its name from its triangular shape, resembling that of the fourth letter in the Greek alphabet—is the broadest and the most fertile part; and presents a fine region for successfully rearing the animal. Here he might roam at will; and, in the days of old, as he "increased and multiplied," he supplied other countries with his kind for the purposes of war. It is a remark-

able fact, however, that although there was a mounted cavalry in Egypt, and, as already observed, that Solomon's horsemen were mounted on trained Egyptian animals, there is but one representation of a man on horseback in the whole range of the sculptured and painted antiquities of that country.

In the *Adventures of Giovanni Finati*, the following anecdote is given of an Arab robber, who, when the Mamelukes were in Egypt, had taken a fancy to the horse and the robe of one of their Beys:—

"When some of the Mamelukes were encamped about Minich, a thief set his mind upon carrying off the horse and wearing apparel of one of their Beys; and, with this intention, contrived, in the dead of the night, to creep unperceived within the tent, where, as it was winter, embers were burning, and showed the rich clothes of the Bey lying close at hand. The thief, as he squatted down by the fire, drew them softly to him, and put them all on: and then, after filling a pipe and lighting it, went deliberately to the tent door, and tapping a groom, who was sleeping near, with the pipe end, made a sign to him for the horse, which stood piquetted in front. It was brought; he mounted and rode off. On the morrow, when the clothes of the Bey could not be found, no one could form a conjecture as to what could have become of them, until the groom, on being questioned, maintained to his fellow-servants, that their master was not yet returned from his ride! and told them how he had suddenly called for his horse in the night; which, at last, seemed to give some clue to what had really happened. Upon this, the Bey, anxious to recover his horse, as well as curious to ascertain the particulars, ordered it to be published abroad, that, if the person who robbed him would, within two days, bring back what he had taken, he should not only be freely pardoned, but should receive also the full value of the animal and of the suit of clothes.

"Relying on the good faith of his promise, and possibly, too, not a little vain of his exploit, the Arab presented himself, and brought his booty. The Bey also, on his part, punctually kept his word; but since, besides the loss, there was something in the transaction that placed the Bey in rather a ludicrous light, it went hard with him to let the rogue depart so freely, and he seemed to be considering what he should do. Whilst thus resolving, and in order to gain time, he kept continually asking, over and over again, fresh and more circumstantial accounts of the manner in which the stratagem had been conducted: but the other was too crafty not to perceive that no good was preparing for him, and began to feel anxious to get safe out of the scrape. He showed no impatience, however, but entered minutely into every detail, accompanying the whole with a great deal of corresponding action; at one time sitting down by the fire, and making believe as though he were slily drawing on the different articles of dress, so as to throw the Bey himself, and all who saw and heard him, into fits of laughter. When he, at last, came to what concerned the horse, 'It was,' he said, 'brought to me, and I leaped upon his back;' and so in effect flinging himself again into the saddle, and spurring the flanks sharply with the stirrup-irons, he rode off with all the money that he had received for the animal, in his pocket, and had got much too far, during the first moments of surprise, for any of the bullets to take effect that were fired at him in his flight; and nothing further was ever heard of him or the horse."

The animal of the Bey was, no doubt, of a better quality than are the generality of Egyptian horses, or the speed of the robber would have relaxed soon enough to have allowed him to have been overtaken by that of some of the others that joined in the pursuit.

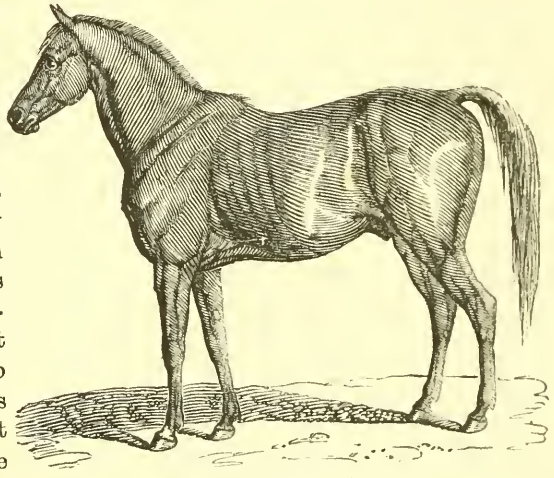
THE BARB.

Proceeding from Egypt along the northern coast of Africa, we enter the states of Barbary, which are understood to comprise the Mauritania, Numidia, Africa Proper, and Libya of antiquity. These, in succession, answer to the modern Morocco, Algiers, Tunis, and Tripoli—states which formerly seemed to constitute one great political confederacy, though regulating their internal policy and government entirely independent of each other. Barbary derives its modern name from Bar, a desert; and is divided into two parts by the Atlas mountains, which extend from east to west, and are intersected by deep and beautiful valleys. This, then, is the country

of the horse known as the Barb. Its original country is Arabia; and it was brought into Africa by those Arabs who either voluntarily left their country, or were driven from it by force of arms. The true animal is found in Morocco, Fez, and Tripoli, and is described by Berenger as seldom exceeding fourteen and a-half hands high. He further says that the countenance is indicative of spirit, though frequently rounded, and, in this particular, presenting a marked distinction to that of the Arabian. The ears are pointed and small, but occasionally they are to be found long and drooping. The crest is generally fine, but prominent, and not overladen with mane. "The neck is of a good length; the shoulders flat and oblique; the withers prominent, and the chest almost invariably deep; the back is moderately curved, and the carcass somewhat round; the arms and thighs are muscular, and strongly marked; the knee and hock are broad and low-placed; the back-sinews singularly distinct, and well-marked from the knee downwards; the pasterns rather long; the feet firm, and but moderately open at the bars." The croup, as compared with the Arab, is said to be a little too long; but the quarters are muscular and well developed.

The Barb has vastly contributed to the beauty and excellence of the horses of the Iberian peninsula; and when higher qualities in the horses of Great Britain were anxiously sought, the Barb was introduced, and has been the means of greatly improving the racing blood of this country. In Africa mares are never ridden, but always stallions—a practice just reversed in Arabia. The reason for these national peculiarities is obvious. The Arab is almost always at war; and as the stallion neighs whenever it smells the stale of the mare, this would frequently be the means of alarming his enemies when secretly approaching their encampments during the night, in his predatory expeditions. The African pursues a different mode of warfare from this. He trusts to the superiority of his force or skill; fights by day; and therefore rides the animal that he deems best adapted to carry him safe through his enterprises, whatever may be the danger in which these may involve him.

Bruce, in his African travels, observes, that "the best African horses are said to be descended from one of the five on which Mahomet and his four immediate successors fled from Mecca to Medina, on the night of the Hegira." But this must be taken as an Oriental fiction, rather than as a statement of sober truth. The affection of the Arab for his horse is so strong, that there is no origin, however noble, to which, so far as breed or race is concerned, he would not assign him. D'Arvieux describes the lamentations of one Ibrahim Abou Vouasses, over a favourite mare of noble race which he had parted with, and which he frequently made a journey to Rama to see. "He would embrace her, and wipe her eyes with his handkerchief, and rub her with his shirt sleeves, and would give her a thousand blessings during whole hours that he would be talking to her. 'My eyes, my heart, my soul!' would he exclaim, 'must I be so unfortunate as to have thee sold to many masters, and not be able to keep thee myself? I am poor, my gazelle. You know well enough, my sweet, that I have brought thee up like a child. I never beat thee, never chid thee, but did cherish thee as the apple of mine eye. God preserve thee, my dearest! Thou art beautiful, thou art sweet, thou art lovely. God defend thee from the evil eye.' And so he would go on saying a thousand things like these; he then embraced her, kissed her eyes, and went backwards, bidding her the most tender adieus."



THE ARABIAN HORSE.

It is not a characteristic of either the English or the Scotch mind, to indicate any

affection which they may have for their horses in such generous expressions of endearment as mark those of the poor Arab; yet few can read the touching narrative which Mungo Park gives of his parting with his horse, the worn-out associate of his adventures, in the wilds of Africa, without entering largely into his feelings, and deeply sympathising with his forlorn and destitute condition. "Early in the morning," says he, under the date of July 29th, "my host observing that I was sickly, hurried me away, sending a servant with me as a guide to Kea. But though I was little able to walk, my horse was still less able to carry me; and about six miles to the east of Modiboo, in crossing some rough clayey ground, he fell; and the united strength of the guide and myself could not place him again upon his legs. I sat down for some time beside this worn-out associate of my adventures; but finding him still unable to rise, I took off the saddle and bridle, and placed a quantity of grass before him. I surveyed the poor animal as he lay panting on the ground, with sympathetic emotion; for I could not suppress the sad apprehension, that I should, myself, in a short time, lie down and perish in the same manner, of fatigue and hunger. With this foreboding I left my poor horse, and with great reluctance I followed my guide on foot along the bank of the river until about noon, when we reached Kea, which I found to be nothing more than a small fishing village." The horse, however, did not die, but was restored, and Park had the great gratification of once more hearing him neigh on his return to Modiboo.

Major Denham, another celebrated African traveller, also laments the death of his horse. After telling us that the animal had carried him from Tripoli to Mourzuk and back again, and also over the whole journey from Tripoli to Bournou, he thus philosophises:—"There are situations in a man's life in which losses of this nature are felt most keenly, and this was one of them. It was not grief, but it was something very nearly approaching to it; and although I felt ashamed of the degree of derangement which I suffered from it, yet it was several days before I could get over the loss. Let it, however, be remembered, that the poor animal had been my support and comfort—may I not say my companion?—through many a dreary day and night; had endured both hunger and thirst in my service with the utmost patience; so docile, that he would stand still for hours in the desert while I slept between his legs, his body affording me the only shelter that could be obtained from the powerful influence of a noon-day sun; he was the fleetest of the fleet, and ever foremost in the race."

In the *Biographical Sketches of Horses*, by Captain Brown, we find recorded the following interesting description of a Barb and his rider at the Cape of Good Hope:—"I should have found it difficult to give credit," says Mr. De Pages, "had what I am now about to relate not happened at this place, on the evening of my arrival there (Cape of Good Hope), and had I not been an eye-witness of those vehement emotions of sympathy, blended with admiration, which it had justly excited in the mind of every individual at the Cape. A violent gale of wind setting in from the north-north-west, a vessel in the road dragged her anchors, was forced on the rocks, and bulged; and while the greater part of the crew fell an immediate sacrifice to the waves, the remainder were seen from the shore, struggling for their lives by clinging to the different pieces of the wreck. The sea ran high, and broke over the sailors with such amazing fury, that no boat whatever could venture off to their assistance. Meanwhile a planter, considerably advanced in life, had come from his farm to be a spectator of the shipwreck. His heart was melted at the sight of the unhappy seamen; and knowing the bold and enterprising spirit of his horse, and his particular excellence as a swimmer, he instantly determined to make a desperate effort for their deliverance. He alighted, and blew a little brandy into his horse's nostrils; when, again seating himself firm in the saddle, he instantly pushed into the midst of the breakers. At first, both disappeared; but it was not long before they floated on the surface, and swam up to the wreck; when, taking with him two men, each of whom held by one of his boots, he brought them safe to shore. This perilous expedition he repeated no less than seven times, saving the lives of fourteen individuals; but, on his return the eighth time, his horse being much fatigued,

and meeting a most formidable wave, caused him to lose his balance, and he was overwhelmed in a moment. The horse swam safely to land, but his gallant rider, alas! was no more."

Whilst giving a description of the horse's services in this dangerous undertaking, we regret the writer has not rescued from oblivion the name of its gallant rider. The exploit of the horse becomes the more prominent feature in this description; but without any wish to decry the merits of this noble animal, we think, in justice to its rider, who fell a sacrifice to his humanity, an effort should have been made to preserve the name of the man who had performed such repeated acts of heroism. The colony was at this time in the possession of the Dutch; and, we believe, a vessel was named after the rider, and a pillar ordered to be erected to his memory. The local authorities, however, with the proverbial meanness of little minds, refused to bestow upon the son a trifling place which had been filled by his generous father.

THE DESERT HORSE, AND SWIFT HEIRIES OF AFRICA, Etc.

As we proceed towards the west coast of Africa, the Barb is said to improve both in form and gracefulness of action; but deep in the Sahara desert, there is a species called the "wind-sucker, or desert horse"—a description of which, in conjunction with that of the heiries, will now occupy our attention. Mr. Jackson, in his account of Morocco, says, that the *shrubach errech*, or desert horse, is to the common horse what the desert camel is to the camel of burden; the only difference between them in point of feeding is, that this horse requires a portion of camel's milk every day; if it cannot get this, and is obliged, from hunger, to eat barley and straw, particularly when first brought to Morocco, it falls away. However, it gradually recovers, fills up, and becomes handsome to the sight, but loses all its former speed, so that it is afterwards employed to hunt ostriches, at which sport it is very expert. To the Arabs of the desert, the chase of the ostrich is the most attractive and eagerly sought of the many aristocratic diversions in which they indulge; and the training through which the horse passes, previous to the sport, is rather hard. Seven or eight days before the intended hunt, they are entirely deprived of straw and grass, and fed on barley only. They are only allowed to drink once a-day, and that at sunset—the time when the water begins to freshen: at that time also they are washed. They take long daily exercises, and are occasionally galloped, at which time care is taken that the harness is right, and suited to the chase of the ostrich. "After seven or eight days," says the Arab, "the stomach of the horse disappears; while the chest, the breast, and the croup remain in flesh: the animal is then fit to endure fatigue." They call this training *techaha*. The harness used for the purpose in question is lighter than ordinary, especially the stirrups and saddle, and the martingale is removed. The bridle, too, undergoes many metamorphoses; the mountings and ear-flaps are taken away, as too heavy. The bit is made of a camel rope, without a throat-band, and the frontlet is also of cord; and the reins, though strong, are very light. The period most favourable for ostrich-hunting is that of the great heat; the higher the temperature, the less is the ostrich able to defend himself. The Arabs describe the precise time as that, when a man stands upright, his shadow has the length only of the sole of his foot.

Each horseman is accompanied by a servant called *zemmal*, mounted on a camel, carrying four goat-skins filled with water, barley for the horse, wheat-flour for the rider, some dates, a kettle to cook the food, and everything which can possibly be required for the repair of the harness. The horseman contents himself with a linen vest and trousers, and covers his neck and ears with a light material called *havuli*, tied with a strip of camel's hide; his feet are protected with sandals, and his legs with light gaiters called *trabag*. He is armed with neither gun nor pistol, his only weapon being a wild olive or tamarind stick, five or six feet long, with a heavy knob at one end.

The exact position of the ostriches being known, the plans are arranged; the horsemen divide and form a circle round the game at such a distance as not to be seen. The servants wait where the horsemen have separated, and as soon as they see them at their posts, they walk right before them; the ostriches fly,

but are met by the hunters, who do nothing at first but drive them back into the circle; thus their strength is exhausted by being made to continually run round in the ring. At the first signs of fatigue in the birds, the horsemen dash in—presently the flock separates; the exhausted birds are seen to open their wings, which is a sign of great exhaustion; the horsemen, certain of their prey, now repress their horses; each hunter selects his ostrich, runs it down, and finishes it by a blow on the head with the stick above mentioned. The moment the bird falls, the man jumps off his horse, and cuts her throat, taking care to hold the neck at such a distance from the body as not to soil the plumage of the wings. The male bird, while dying, utters loud moans, but the female dies in silence.

When travelling in the desert on these horses, as well as on the heiries, or desert camels, the bowels of the riders become relaxed by the time they have arrived at the end of their journey. They are then forced to take a draught of camel's milk, which being rejected by the stomach, they drink again. This second draught is, after a longer time, also rejected; when a third is taken, by which time the tone of the stomach is generally restored to be capable of retaining the beverage, which is converted into nourishment.

Although hardly coming within the legitimate province of our subject, yet in speaking of the "wind-sucker," we deem it necessary to make a few observations on the heirie, of which he is a frequent companion in the desert.

This animal is, in figure, similar to the common camel of burden, but more elegantly formed. The Arab, with his loins, breast, and ears bound round, to prevent the percussion of air proceeding from a quick motion affecting him, rapidly traverses, upon the back of this abstemious quadruped, the scorching desert, the fiery atmosphere of which parches, and almost impedes respiration, to such an extent as nearly to produce suffocation.

The motion of the heirie is violent, and can be endured only by those patient and hardy Arabs who are accustomed to it. These riders will make a journey of three days almost without food—a few pipes of tobacco, or a handful of dates, serving to supply their necessities.

With a bakul, or goat-skin, a porous earthen vessel filled with water, a few dates, and some ground barley, the Arab travels from Timbuctoo to Tafilelt, feeding his heirie but once, at the station of Arzawad; and this camel, on an emergency, will abstain from drinking seven days. In general, he has a ring put through the upper lip, to which is fixed a leathern strap, answering the purposes of a bridle; the saddle is similar to that used by the Moors, or what the mountaineers of Andalusia make use of.

The swiftness of the heirie is thus figuratively described by the Arabs:—"When thou shalt meet a heirie, and say to the rider 'Salem Alic' (peace be unto thee), ere he shall have answered the salutation, he shall be nearly out of sight; for the swiftness of his camel is like the wind."

The most inferior kind of heiries are called Talatayee—a term expressive of their going the distance of three days' journey in one. The next kind is called Sebayee—expressing an animal that goes seven days' journey in one; and this is their general character. There is also one called Tasayee, or the heirie of nine days; but this species is extremely rare.

THE NUBIAN OR DONGOLA, AND ABYSSINIAN HORSES.

Nubia, or Dongola, lies to the south of Egypt, and has, on the east, the Red Sea; on the west the Desert; and is bounded on the south by Senaar. The Nile is also its great river, and the date is the principal fruit of the country. The low shrub of the Senna is abundant, and the climate is considered healthy in general. Here there is said to be a breed of horses distinct from any other which either Africa or Arabia produces. Ludolph, who passed through this country in the 17th century, says, that the horses are spirited, powerful, and active, and mostly of a black colour; that they are used for the chase and for war; and that they are not fatigued by travelling long journeys, for the labour of carrying or drawing loads is put upon mules. The appearance of this animal is mostly described as especially noble and majestic. He is usually well-caparisoned; and although the colour is generally black, yet there are to be found some of them bay and sorrel. Bruce, the Abyssinian traveller, speaks of the Nubian

horse in the following terms:—"What figure the Nubian breed of horses would make in point of swiftness is very doubtful, their form being so entirely different from that of the Arabian; but if beautiful and symmetrical parts, great size and strength, the most agile, nervous, and elastic movements, great endurance of fatigue, docility of temper, and, beyond any other domestic animal, seeming attachment to man, can promise anything for a stallion, the Nubian is, above all comparison, the most eligible in the world. Few of them are less than sixteen hands high."

Bosman, another traveller, describes the Nubian horse as the most perfect of his kind; and says that, in 1816, one of them was sold in Grand Cairo for a thousand pounds. Several of the species have been introduced to England, but with what results we have been unable to ascertain.

The Abyssinians, according to Bruce, destroy the elephant for food. "They cut the whole of the flesh off his bones into thongs, like the reins of a bridle, and hang these, like festoons, upon the branches of trees, till they become perfectly dry, without salt; and then they lay them up for their provisions in the season of the rains." This traveller has given an animated description of an elephant hunt, conducted by the Africans, who, on such occasions, are greatly assisted by their spirited horses.

"An hour before day, after a hearty breakfast, we mounted on horseback, to the number of about thirty But there was another body, both of horse and foot, which made hunting the elephant their particular business. These men dwell constantly in the woods, and know very little of the use of bread, living entirely upon the flesh of the beasts they kill, chiefly that of the elephant and rhinoceros. They are exceedingly thin, light, and agile, both on horseback and foot; are very swarthy, though few of them are black; none of them woolly-headed, and all of them have European features. They are called *agageer*, a name of their profession, not of their nation; which comes from the word *agar*, and signifies to hamstring with a sharp weapon. More properly it means the cutting of the tendon of the heel, and is a characteristic of the manner in which they kill the elephant, which is shortly as follows:—

"Two men absolutely naked, without any rag or covering at all about them, get on horseback; this precaution is for fear of being laid hold of by the trees or bushes, in making their escape from a very watchful enemy. One of these riders sits upon the back of the horse, sometimes with a saddle, and sometimes without one, with only a switch or short stick in one hand, carefully managing the bridle with the other; behind him sits his companion, who has no other arms but a broadsword. His left hand is employed in grasping the sword by the handle; about fourteen inches of the blade is covered with whip-cord. This part he takes in his right hand, without any danger of being hurt by it; and, though the edges of the lower part of the sword are as sharp as a razor, he carries it without a scabbard.

"As soon as the elephant is found feeding, the horseman rides before him as near his face as possible; or, if he flies, crosses him in all directions, crying out, 'I am such a man and such a man; this is my horse, that has such a name. I killed your father in such a place, and your grandfather in such another place; and I am now come to kill you. You are but an ass in comparison of them.' This nonsense, he verily believes, the elephant understands, who, chased and angry at hearing the noise immediately before him, seeks to seize him with his trunk or proboscis; and, intent upon this, follows the horse everywhere, turning and turning round with him, neglectful of making his escape by running straight forward, in which consists his only safety. After having made him turn once or twice in pursuit of the horse, the horseman rides close up alongside of him, and drops his companion just behind on the off side; and while he engages the elephant's attention upon the horse, the footman behind gives him a drawn stroke just above the heel or what in man is called the tendon of Achilles. This is the critical moment; the horseman immediately wheels round, takes his companion up behind him, and rides off at full speed after the rest of the herd, if they have started more than one; and sometimes an expert agageer will kill three out of one herd. If the sword is good, and the man not afraid, the tendon is commonly entirely separated; and if it is not cut through, it is generally so far divided, that the animal, with the stress he puts upon it, breaks the remaining part asunder. In either

case, he remains incapable of advancing a step till the horseman's return, or his companions, coming up, pierce him through with javelins and lances; he then falls to the ground, and expires with loss of blood.

"The agageer nearest me presently lamed his elephant, and left him standing. Ayto Engedan, Ayto Confu, Guebra Marram, and several others, fixed their spears in the other before the agageer had cut his tendons. My agageer, however, having wounded the first elephant, failed in the pursuit of the second; and being close upon him at the entrance of the wood, he received a violent blow from the branch of a tree which the elephant had bent by his weight, and, after passing, allowed it to replace itself, when it knocked down both the riders, and very much hurt the horse. This, indeed, is the great danger in elephant-hunting; for some of the trees, that are dry and short, break by the violent pressure of so immense a body moving so rapidly, and fall upon the pursuers, or across the road. But the greatest number of these trees bend without breaking, and return quickly to the former position, when they strike both horse and man so violently, that they often beat them to pieces."

THE ARABIAN HORSE.

Arabia has been considered, by some naturalists, the original country of the horse, but upon what grounds it is not so easy to determine. It has already been shown that Solomon received all his own horses from Egypt; and those which he sent to the sovereigns of Phœnicia, he also procured from that country. Even so late as the second century of the Christian era, there is a record extant, showing that horses were among the *articles* exported from Egypt to Arabia; and, in the seventh century, when Mahomet attacked Koreish, near Mecca, he had no more than two horses in his whole army. Such circumstances speak strongly against the assertion that the horse is originally Arabian; for if he were so, it is difficult to account for his scarcity in a country which, of all others, ought to have been the most natural for his rapid propagation. At what time the Arabs began to employ him is not very clear. At all events, from the facts just given, it must have been at a comparatively late era. Where they obtained their breed, it is likewise impossible accurately to determine. In our opinion, Arabia is more likely to have been supplied from the Egyptian stock, rather than from that of any other land; for if, in the days of Solomon, the Arabian horses had been distinguished, that monarch would have supplied his stables with, at least, a few of them, for the mere purposes of display, if for nothing else. Taking into account the physical features of Arabia, we should think it is not very favourable for rapidly increasing the breed of horses. Designated, in its three great geographical divisions, as the Stony, the Desert, and the Happy, it has been compared to a coarse garment with a rich border. In its centre it presents nothing more than a dreary plain of sand, alike destitute of water and vegetation—marked only by the tracks of caravans. A chain of mountains runs along the west to the Arabian Sea on the south; but it has no river of a magnitude sufficient to make it important. The few streams which wander over the country are generally absorbed by the sandy tracts they pervade, and decrease in volume during their progress to the sea. The mountains are few, and its climate is sultry. Vegetables of every description are scarce. The coffee shrub, planted on terraces in the form of an amphitheatre, grows to perfection; and the date, the tamarind, and the orange, also flourish: but horses neither drink coffee, nor eat tamarinds or oranges;* and hence are more likely to have had their origin in a country much better adapted by nature to their wants than Arabia seems to be. Burchardt says that the tribes richest in horses, are those who dwell, during the spring of the year at least, in the fertile plains of Mesopotamia; for, notwithstanding all that is said of the desert horse, plenty of nutritious food is absolutely requisite for its reaching its full vigour and growth. The numerous tribes in the Red Sea, between Akaba and Mecca,

* In Medjed the horse is said to feed regularly on dates; and it has been asserted, that even boiled and raw flesh are given to them by some of their more wealthy proprietors. Very little water, however, is allowed them, the Arabs thinking that much liquid affects the wind, as well as mars the proportions of their favourite animal, and renders him less beautiful to look upon.

and especially those to the south of Mecca, as far as Yemen, have very few horses, but the Kurds and the Bedouins, in the east, and especially in Mesopotamia, possess more horses, and more valuable ones, than all the Arabian Bedouins put together; for the richness of their pastures easily nourishes the colts, and fills the studs. "The number of horses in Arabia," he adds, "is not more than 50,000 —a number far inferior to that found in any part of Europe or Asia, on an equal extent of ground."

According to the same author, there are in Syria, at the present day, three breeds of horses—the true Arab breed, the Turkman, and the Kourdy; the last being a mixture of the two former. From the superior size, and more martial appearance of the Turkman horse, he makes a splendid figure when dressed in Turkish trappings; and, on this account, is, by the Osmanlis, preferred to the Arab horses. They are trained to walk with great grace; to start suddenly off at full speed; to turn with the gentlest touch, and to stop short instantaneously. The Arab horse is more hardy, more beautifully limbed, and much fleeter than the Turkman; but he is more slender, and less strong in his appearance. The esteem in which the Arab holds his animal, however, has no counterpart in any other country. The Rev. V. Monro, in his *Summer's Ramble in Syria*, when on a visit to the river Jordan, says, that "one of the Arab escort, a great ruffian, was mounted on a white mare of great beauty; her large fiery eye gleamed from the edge of an open forehead, and her exquisite little head was finished with a pouting lip and expanded nostrils; her ribs, thighs, and shoulders, were models of make, with more bone than commonly belongs to the Syrian Arab; and her stately step received additional dignity from the manner in which she took it; whilst the carriage of her tail gave the infallible indication of good family. Having inquired her price, I offered the sum; whereon the dragoon asked one-third more. After much abating and debating, I acceded; and he immediately stepped back in the same proportion as before. This is invariably the practice with the Arabs; I, therefore, discontinued my attempts to deal. The Arab said he loved his mare better than his own life; and that, when mounted upon her, he felt rich as a pasha. Shoes and stockings he had none; and the net value of his dress and accoutrements might be calculated at something under seventeen-pence sterling."

M. De Chateaubriand, upon what authority we know not, records an instance of reciprocal affection between an Arab horse and his master; which, if it be not of pure invention, has seldom, if ever, been paralleled.

An Arab and his tribe had, with complete success, attacked in the desert the caravan from Damascus; and when the Arabs were occupied in packing their booty, the horsemen of the pasha of Acre, who had come to meet the caravan, rushed suddenly on the robbers, and killed a considerable number of them, and made others prisoners. Having tied these with cords, they took them to Acre, as presents to the pasha.

Abon el Masseh, the hero of this predatory attack, had received a ball in his arm during the engagement; but as his wound was not mortal, the Turks had fastened him upon a camel, and took his horse along with him.

The evening of the day of their approach to Acre, the party encamped with their prisoners upon the mountain of Safhadt. The legs of the wounded Arab were tied together by a leathern belt, and he was laid near the spot where the Turks slept. Kept awake, during the night, by the pain of his wound, he heard his horse neigh among others picketed round the tents, according to the Eastern custom. Recognising his voice, he could not resist the desire to see once more the former companion of his life. Accordingly, with great difficulty, he managed to crawl on his hands and knees to his steed. "My poor friend," said he, addressing the animal of his affections; "what canst thou do among these Turks? Thou wilt be imprisoned under the roof of a khan, with the horses of an aga or pasha. The women and children will no longer bring thee the camel's milk, or barley, or doura in their palms. Thou wilt no more course the desert, like the wind from Egypt. No more wilt thou divide, with thy chest, the refreshing waves of Jordan. O that, though I remained a slave, I could at least set thee free! Let me try! There, go! return to our tent; tell my wife that Abon el Masseh returns

to it no more, and lick the hands of my four children."

Thus speaking, Abou had, with his teeth, gnawed the goat's hair which had served to fasten the Arab horses, and the animal became free. Seeing, however, his master manacled and bound at his feet, the faithful and intelligent creature seized his master by the leathern girdle round his body, set off at a gallop, and carried him to his tent. Arriving there, and letting him drop on the sand, at the feet of his wife and children, the horse expired from fatigue.

The whole tribe wept his loss; poets sang his merits; and his name is constantly in the mouths of the Arabs who inhabit the country about Jericho.

If this is not a fiction, truth is certainly much more strange than romance; but, in this country, we have but a slight idea of the degree of attachment and intelligence, which the habit of living with the family, of being caressed by the children, fed by the women, and encouraged or chided by the voice of the master, adds to the natural instinct of the Arabian horse. The breed of the animal has, naturally, a higher intelligence than belong to the horses of our island, arising, perhaps, more from the constancy of their companionship or association with man, than from any extraordinary endowments which nature has bestowed upon them.

The same author tells us, that when he was at Jerusalem, there was a Bedouin, who, on being pursued by the governor's guards, rushed on his mare from the top of the hills that overlook Jericho. The animal scoured, at full gallop, down a declivity, without stumbling, leaving his pursuers lost in astonishment and admiration. The poor mare, however, dropped down dead on entering Jericho; and the Bedouin, who would not quit her, was taken, weeping over the body of his faithful companion. "This mare," continues Chateaubriand, "has a brother in the desert, who is so famous that the Arabs always know where he is, what he is doing, and how he does."

It is generally believed that many Arabs preserve the pedigrees of their horses; and that there are five noble breeds, each of which they deduce from one of the five favourite mares of Mahomet. These five races, however, diverge into innumerable ramifications; and any mare of superior excellence may be the original of a new breed, the descendants of which are called after her. "On the birth of a colt of noble breed, it is usual to assemble witnesses, to write an account of its distinctive marks, with the name of its sire and dam. These genealogical tables never ascend to the grand-dam, because it is presumed that every Arab of his tribe knows, by tradition, the purity of the whole breed. Nor is it always necessary to have such a certificate; for many horses and mares are of such illustrious descent that thousands might attest the purity of their blood. The pedigree is often put into a small piece of leather, covered with a waxed cloth, and hung by a leather thong round the horse's neck."

In Weston's *Fragments of Oriental Literature*, the following pedigree—much longer, and, no doubt, far nobler than that alluded to by the Laird of Cockpen, as belonging to his Scotch sweetheart—was found hanging round the neck of an Arabian horse, bought by Colonel Ainslie, during the Egyptian campaign of the British against the French, at the commencement of the present century:—

"In the name of God, the merciful and compassionate, and of Saed Mahomed, agent of the High God, and of the companions of Mohammed, and of Jerusalem. Praised be the Lord, the Omnipotent Creator.

"This is a high-bred horse, and its colt's-tooth is here in a bag about his neck, with his pedigree, and of undoubted authority, such as no infidel can refuse to believe. He is the son of Rabbamy, out of the dam Labadah, and equal in power to his sire: of the tribe of Zashalah; he is finely moulded, and made for running like an ostrich. In the honours of relationship, he reckons Zaluah, sire of Mahat, sire of Kallac, and the unique Alket, sire of Manasseh, sire of Alsheh, father of the race down to the famous horse, the sire of Lahalala; and to him be ever abundance of green meat, and corn, and water of life, as a reward from the tribe of Zashalah; and may a thousand branches shade his carcass from the hyæna of the tomb, from the howling wolf of the desert; and let the tribe of Zashalah present him with a festival within an inclosure of walls; and let thousands assemble at the rising of the sun in troops hastily, where the tribe holds up under a

canopy of celestial signs within the walls, the saddle with the name and family of the possessor. Then let them strike the bands with a loud noise incessantly, and pray to God for immunity for the tribe of Zoab, the inspired tribe."

At the birth of an Arabian colt it is never permitted to fall to the ground, but is caught in the arms of those who are waiting beside the dam, washed, and as tenderly handled as if it were destined to become a distinguished member of the human family. At the end of a month it is weaned, and then, for a hundred days, it is nourished with camel's milk. After this time it is allowed a little wheat, which is increased by degrees, while the milk continues to form the largest portion of its aliment. This mode of feeding continues for another hundred days, when the foal is sent forth to pick a little of the herbage that may be growing round the tent of its owner. Some barley is also given; and, if the Arab can afford it, a little camel's milk in the evening. All this while it, with its dam, inhabits the same tent as the Bedouin and his family, who are to be found, much more frequently, lying with, or rolling upon the mare and her foal, than upon their own natural parents. Thus the animals grow kind and gentle. In the constant habit of receiving good treatment, their tempers are never ruffled; and the caresses which, from the moment of their birth, are bestowed upon them, they continue to return by every means in their power. This characteristic of the Arab horse is thus referred to by Bishop Heber, who, in his *Narrative of a Journey through the Upper Provinces of India*, says that he was in the habit of riding a little Arabian animal:—"My morning rides are very pleasant. My horse is a nice, quiet, good-tempered little Arab, who is so fearless, that he goes, without starting, close to an elephant; and so gentle and docile, that he eats bread out of my hand, and has almost as much attachment and coaxing ways as a dog. This seems the general character of Arab horses, to judge from what I have seen in this country. It is not the fiery, dashing animal I had supposed, but with more rationality about him, and more apparent confidence in his rider than the majority of English horses."

A French authority, in giving his own personal experience of the Arabs and their horses, says, that Arabian horses in general come from Nedgid, and are commonly called Nedji. A more noble race is called Kohloni—divided into five different families, or noble Cherifs. These five races, as we have already observed, are the supposed descendants from the five blessed mares of the prophet, and are named Tonaisse, Gilphe, Manegine, Sedie, and Seclawe. Besides these, there are a number of other families too difficult to enumerate. It must be owned that there are *no* certain signs by which one can ascertain whether a horse is a Nedgid or a Kohlan; for "I have conversed," says he, "with many intelligent Arabs, who all assured me that they could not distinguish them unless the origin of the dam was known to them. For these reasons they kept their mares unstained by the leap of an inferior stallion, which is considered one of the principal sins in the Koran; and, as this is an injunction imposed upon them by their religion, they preserve it rigidly. If by chance the contrary should happen, the Bedouin does not value the foal the least; and however handsome and promising it may be, he will part with it for a mere trifle. If a Kohlan mare is stinted to a Nedgid stallion, the foal is a Kohlan; but if only to a Genesidek, the foal also is only a Genesidek; and a foal only of a Nedgid mare by a Kohlan stallion, is Nedgid. This being the case, among the latter, many horses will be met with as handsome as the first, although of an inferior race; but even the Arabs cannot distinguish them without knowing the race of the dam."

Although it is generally asserted that the Arabs keep a stud-book, our French authority denies this to be the case; and he further says that they do not call together a number of witnesses when the covering act is performed, or when the foal is born: all this is false; "for," he continues, "I have often had opportunities to observe a leap in the night, where scarcely any, and but casual witnesses were present." This, however, might casually be the case; although, generally, where purity of breed is to be anxiously kept, veracious witnesses might be called in to testify satisfactorily to the birth. According to our authority, the mode of proceeding among the Arabs to procure a foal, is to choose the best

horse among their own or neighbouring tribe for a covering stallion, which they travel about with, as Europeans do; and it is very difficult to purchase him, at least during the covering season. The horse serves three mares daily at about one Spanish dollar each, and travels from tribe to tribe, at times to a great distance. They allow their horses to cover as early as two years old; and frequently the mares are not older. It happens, however, that not unfrequently they are worthless at three or four years old. Stallions, mares, and foals all graze together.

The Arab generally rides without a bridle: a halter, with a nose-band covered with iron like a cavesson, serving him instead. In lieu of a saddle, his noble courser has only a piece of wadded linen, with two napes for stirrups, fastened on his back; and, as in many parts of Germany, he seldom has the hind feet shod.

The many scars seen on Arabian horses, have been caused by firing, which is much practised, as a remedial agent, in cases of disease. Many of the horses—even two-year olds—are disfigured by scars above and beneath the fetlocks, which at first might be taken for splents, but which originate from the iron manacles by which they are fastened to prevent them being stolen, to which they are much exposed from their being, during the whole of the day, left out grazing, and at times suffered to stray from the camp to a considerable distance. At night, however, every Arab has each animal before his tent, with one of his legs tied, which prevents him from going far from the spot where his master has, for the time being, pitched his fragile abode.

Regarding the formation and shape of their stallions, the Arabs seem to be quite indifferent. If the animal runs well, is of the proper origin, and has no *superstitious* marks, they use him as such, and will, without hesitation, put him to their best mares; but if the origin of the most splendid-looking stallion is doubtful, and his marks ill-favoured, he would not be put to the worst of mares. In candour it must be owned, that though the stallions may have great faults in point of form, they, at the same time, have extraordinary qualities; for as soon as they are mounted, all defects vanish. It would be almost impossible to detect any, so noble is their appearance. Many stallions with ugly hind-quarters, and with their tails set very low, appear, when they are mounted, to carry their tails so erect, that one might doubt whether they were the same horses. A few of the finest horses, so far as look goes, exhibit all the characteristics of English thorough-breds, but are much more active and pleasant to ride, when broken in a little after the European fashion. When they are taken raw from the desert, and wholly unused to bridle or spur, they walk with terror on any paved way. They are then difficult to be made to trot, as their habit is to jump, at once, out of a walk into a full gallop, and stop as suddenly; but being very docile, they are easily broken-in properly.

The five principal races, which are said to have originated from the five favourite mares of the Prophet, and which only deserve the name of Kohlan, are mostly met with at Bagdad and Orfa. Some European judges prefer the Nedgid to the Kohlan; but the Oriental prejudice always returns to the Kohlan, as its race is bred more in and in, like our own race-horses. Although it is difficult to say, with any sort of certainty, whether a horse is a Nedgid or Kohlan, yet it may be remarked that the former has somewhat of a Roman nose and high forehead; whilst a true Kohlan, with a genuine certificate, has a nose drawn inwards like a jack or pike, large eyes, wide nostrils, a broad front, and a beautiful head. One may buy without difficulty a stallion; but an Arab seldom parts with a mare; and, if pressed by necessity, he manages as follows:—First, the price is agreed upon: the purchaser then begins to use the mare, and the first and second foals are delivered to the seller, who, if he likes, has the right to deliver, in return, one foal for the dam. These conditions often vary; for at times the owner will not sell above a fourth of the mare; which, in the Arabian language, is called purchasing one foot.

As few, if any, of our readers are likely to visit Arabia for the purpose of purchasing horses, seeing that a better breed now exists in our own island, it is unnecessary to dilate on the different tribes of desert Cheicks, who may, and may not, be trusted in their horse-dealing transactions with strangers. We may observe, however, that many of the more

superstitious Arabs are reluctant to show their horses to strangers, from a fear of the "evil eye." The dread of this superstition makes the Arab never omit offering a prayer to Mashalla for protection. Should his horse fall ill after a visit from a stranger, he immediately calls in a sort of wizard, who, after muttering some cabalistical words, breaks an egg on the front of the animal; but whatever may be the imagined efficacy of this talismanic operation, the patient not unfrequently dies; when the wizard gravely says, "God ordained it so," or "it was written so." Thus does the wizard farrier of Arabia slip out of his dilemma, yet still continues to preserve his character. A veterinary surgeon, however, would step in and administer a proper medicine to the animal; and, without the assistance of any magical nomenclature, would save the life of the horse, and smile alike at the remedial egg of the wizard, and the solemnly absurd and cabalistic mode of its application. According to European notions, even some of the prophecies of Mahomet are sheer nonsense, particularly those about colour: others coincide with observations of the present age. If Mahomet actually was inspired by Allah, our wives would do well never to permit their husbands to ride horses which carry the tail on one side, as they are sure to be soon repudiated; and maidens ought to stand in awe of bachelors on stallions which have white spots on their thighs.

No people have surpassed the ancient Arabians in the tenacity with which they have preserved their ancient character and habits. In the life of the modern Bedouins, we still trace the same as that pursued by their remote ancestors, who, in the days of Moses, and in those of Mahomet, dwelt under similar tents, and conducted their flocks and camels to the same prings and pastures. Descended from Ishmael, whose hand, as we read in the Book of Genesis, was against every one, the Arab still keeps up his hostility to all men not of his race. In the desert he is a robber, and in the town he has all the vices of civilisation, without relinquishing those of the savage state. To see a horde of this nomadic people enter the desert, with their women, children, horses, camels, sheep, and goats; to see them pitch their tents, and take up their position on some green spot, amidst a sea of sand, may be deemed one of the most extraordinary episodes that can be witnessed in the great epic of human existence. M. de Portes, an eye-witness of a scene of this kind, furnishes us with a somewhat minute description of its principal features.

First appear a few horsemen on their mares, sweeping along like the wind, armed with long lances, encircling in a gallop the place where they intend to halt, and each individual choosing a particular spot, according to his own fancy. When he has done this, he immediately drives his lance in the ground, and fastens his mare to it; as much as to say, "Here shall I pitch my tent." By this time a great many more are arriving; some on horses, but most on camels; and in the distance a formidable army is seen marching up, *pêle-mêle*, very fast. These are their families and the bulk of the tribe, with their tents, baggage, and camels; some of the animals carrying women or children; others tents and furniture; and an innumerable host following quickly on foot. Those conveying the families are accoutred according to the wealth of the owner. The camel of the Cheick carries a sort of palanquin, in the shape of a canoe, placed at length, and open in front, that the animal may be guided in his course. This receptacle usually contains three or four women, and as many children; these last in a state of nudity. Each family now takes the direction of the lance, which it knows, and, in an astonishingly short time, a town appears to have been built. The whole locality teems with life and bustle; men are shouting and talking; women are getting things into order; whilst naked children are running about and gambolling in the water, wherever they can find a ditch.

The camp is pitched without the least regularity, only the tent of the Cheick is in the centre, and distinguished from the other tents by its larger size. All the tents are made of camel or goat-skins, without elegance or neatness, fastened by two poles six feet high. The interior is divided by a carpet, one half being appropriated by the women, the other by the men and for the reception of strangers. The furniture consists of a few carpets, straw or reed mats, which serve as a bed; but some of the poorer class sleep on the bare earth, only

covered by a *habas*. The most necessary utensils for cooking are striking addenda to the stock of their household "goods and chattels." These generally consist of a pot, of metal; a large metal or wooden plate; a cup, of zinc or wood, out of which they all drink without being cleaned; a coffee-pot of copper, and a cask fabricated of camel-skins.

Simplicity in everything is one of the grand characteristics of these nomades. In point of dress, the men wear a long wide shirt until it actually becomes rotten; nor do they ever take it off except at night, when they lie on it, only covered by a *mechlas* of coarse wool. They also go about barefooted. The Anaze's Arabs, however, display a little more taste. They never leave their tents unarmed; and their weapons consist of a sword, a gun, and a lance; with axes, or other offensive weapons with which they may defend themselves, or destroy those upon whom they make war.

The women are habited in a long shift of blue linen. They also draw a black veil to a knot under the nose, and let it fall gently over their bodies. This veil they often arrange in such a manner as to show a large ring drawn through the right nostril, and fastened with a chain to the temple. They are fond of exhibiting their lips, painted of a blue colour; and they have many figures engraved on the chin, cheek, nose, and neck. They never leave their tents uncovered. In height they are above the middle stature—walking nobly and gracefully, with beautiful black eyes, which they have the art of making appear larger than they really are by painting the eyelids: their noses are well formed; but the other features of their countenances are often disfigured by many different marks. Their hands and arms are always handsome; but their feet are rather broad, never having been compressed by shoes.

The children run about naked, the boys wearing only a tightly laced girdle of leather round their loins. The reason assigned for this custom is, that it makes them strong, enables them to run fast, and, by compressing the stomach, does not allow them to eat so much as they would otherwise do, if nature were left to enjoy the freedom of her own conditions. The men also wear this belt. The children are all usually finely made, none of them being hardly ever deformed. All are very hardy; capable of fighting for a whole day; suffering no injury, though constantly exposed to the excessive heat of an almost vertical sun, whilst engaged in exercising with the lance, or wrestling with each other.

The women attend to the duties of the household, and occupy themselves with weaving and spinning. The affairs of the *cuisine* do not take up much of their time; for although the Arabian is voracious, if an opportunity offer for him to gratify himself with something that he likes, he rarely exceeds a pilau of red rice with melted butter. To this, which usually serves for dinner, sour milk, dates, honey, duphte, &c., are, now and then, added. The women are obliged to grind the corn, which they do by means of a rude species of primitive hand-mill. The bread is baked in flat cakes upon iron plates. The women fetch the water, which is to be procured only at times, and often at a great distance from their tents. So far as cleanliness is concerned in reference to their clothing, both sexes are alike indifferent, generally to a disgusting extent.

In a religious point of view, though excessively superstitious, they are much less devout than the Osmanlis. Many, however, observe the Ramadan; and they pray in company, ranged in one line, with a priest at their head, who has a peculiar pride in converting "the human face divine" into something as hideous as possible. Their wealth consists of camels and horses; of a few herds of sheep and goats, which yield them milk and butter; they also use camel's milk, but have no cows. The number of camels is generally very considerable—many possessing ten, twenty, and upwards; and the Cheick sometimes owns as many as 300, of which he annually sells a considerable number to the Turcomans, who, it is said, have been known to purchase about 2,000, at the rate of 200, and 250 Turkish piasters a-piece, from different Cheicks in the desert. The evening return of the camels to the camp affords a singular sight to a European. From 5,000 to 6,000 of these camp attendants, followed by their young ones, gambol along the barren ground like goats; and their clumsy forms partake largely of the ludicrous when they endeavour to cast off their usual gravity, and begin to frisk about with all the wantonness of a young gazelle.

During the government of the Wahabees, horses became scarcer and scarcer every year among the Arabs. Foreigners rose to be large purchasers of them, and carried them into Yemen, Syria, and Bassora, which latter place supplies India with Arabian steeds. The reason assigned for their masters parting with their animals was, that they were afraid of having them taken from them by their chiefs; for it had become the custom, on every frivolous pretext of disobedience or crime, to pronounce the most valuable Bedouin mare forfeited to the crown.

For the purchase of Arabian horses of true blood, Syria holds the highest rank in the opinion of judges; and Nauran is considered the best district, as the horse can there be purchased at first-hand, on account of the Arabs encamping there during the spring. For a person, however, pursuing the trade as a profession, Damascus would be the best place to live in. Those animals which are bought for the Indian market at Bassora, are obtained at second-hand from Bedouin dealers, who get them from the Montifell Arabs, who do not pay much attention to the preservation of purity in the breed.

In considering the characteristic features in the form of the Arab horse, there is a great deal to excite admiration. His neck is long and arched, and springs gracefully from the chest. After the head, the shoulder is superior to that of any other breed. The shoulder-blade has a beautiful backward inclination; and without the smallest indication of clumsiness, is thickly laid with muscle. The legs, though fine and small, are strong and solid. In short, every feature about him, marks his superiority, and justifies the belief in his capability of accomplishing many of the feats which have been chronicled of him.

The comparative excellences of Oriental horses are thus estimated by a writer in *The Sportsman*:—"Taking the comparative excellence of the different races, Nejid, between the desert of Syria and Yemen, is generally reckoned to produce the grandest, or noblest horses. Hejaz, extending along the Red Sea, from Mount Sinai to Yemen, and including in it Medina and Mecca, the handsomest; Yemen, on the coast of the Red Sea and the Indian Ocean, and the most fertile part of Arabia, the most durable; Syria, the richest in colour; Mesopotamia, the most quiet; Egypt, the swiftest; Barbary, the most prolific; and Persia and Koordistan, the most warlike."

The introduction of the Arabian into England, and the influence he has had on our own racing-blood, will be noticed in another place.

THE PERSIAN HORSE.

When, in the days of antiquity, the Persian horse was considered the best for cavalry in the East, the improved Arabian breed had no existence. He is of larger growth than the Arabian, and his principal points are thus described by Berenger:—"They are, in general, small-headed; they have long and somewhat too fine foreheads, and they are rather too narrow-chested; their legs are a little small, but their croups are well-fashioned, and their hoofs good and firm. They are docile, quick, light, bold, full of spirit, capable of enduring much fatigue, swift, sure-footed, hardy in constitution, and contented with almost any provender." This is a high character; but since the time when Berenger wrote, we believe this breed has somewhat degenerated. It is this animal which figures on the Assyrian sculptures in the British Museum; and it was one of this species which Alexander the Great received and esteemed as a valuable and most acceptable present. Under the reign of Cyrus they became remarkable for the splendour of their trappings. In *Sketches of Persia*, by Sir John Malcolm, he says, that a variety of horses are now produced in Persia; but that the inhabitants of the districts which border on the Gulf, still preserve, in a state of purity, those races of animals which their ancestors brought from the opposite shore of Arabia. In Fars and Irak there is a mixed breed from the Arabian, which, though stronger, is still a small horse compared with either the Toorkoman or Khorassan breeds, which, by the soldiers of Persia, are most prized. Both of these latter races have a large proportion of Arabian blood in them.

Sir R. Ker Porter gives the following account of the Persian horses, and the modo in which they are managed:—

"The Persian horses never exceed fourteen

or fourteen and a-half hands high, yet certainly, on the whole, are taller than the Arabs. Those of the desert and country about Hillah run very small, but are full of bone and of good speed. The general custom is to feed and water them at sunrise and sunset, when they are cleaned. Their usual provender is barley and chopped straw, which, if the animals are piqueted, is put into a nose-bag, and hung from their heads; but, if stabled, it is thrown into a small lozenge-shaped hole, left in the thickness of the mud-wall for that purpose, but much higher up than the line of our mangers; and there the animal eats at his leisure. Hay is a kind of food not known here. The bedding of the horse consists of his dung. After being exposed to the drying influence of the sun during the day, it becomes pulverised, and, in that state, is nightly spread under him. Little of it touches his body, that being covered by his clothing—a large *nummud* from the ears to the tail, and bound firmly round his body by a very long surcingle. But this apparel is only for cold weather; in the warmer season the night-clothes are of a lighter substance; and during the heat of the day, the animal is kept entirely under the shade.

"At night he is tied in the court-yard. The horses' heads are attached to the place of security by double ropes from their halters, and the heels of their hinder legs are confined by cords of twisted hair, fastened to iron rings and pegs driven into the earth. The same custom prevailed in the time of Xenophon, and for the same reason—to secure them from being able to attack and maim each other, the whole stud, generally, consisting of stallions. Their keepers, however, always sleep on their rugs amongst them, to prevent accident: and sometimes, notwithstanding all this care, they manage to break loose, and then the combat ensues. A general neighing, screaming, kicking, and snorting, rouses the grooms, and the scene for awhile is terrible. Indeed no one can conceive the sudden uproar of such a moment, who has not been in Eastern countries to hear it. They seize, bite, and kick each other with the most determined fury, and frequently cannot be separated before their heads and haunches stream with blood. Even in skirmishes with the natives, their horses take part in the fray, tearing each other with their teeth, while their masters are in similar close quarters on their backs."

To see a specimen of the race-running Persian horse, greatly excited the curiosity of Sir R. K. Porter. Accordingly, he went to the races; and as the sovereign was to be present, doubtless the best animals which the country could produce, had entered the lists. The contending horses were divided into three sets, for the purpose of lengthening the sport; and they had been in training several weeks, often going over the ground on which they were to run in that time. The consequence of this was, that when the day on which they were to run came, they were so reduced in weight, that their bodies were nearly cutting the skin. The distance marked for the race was *rather* longer than the distances chalked out by our sportsmen of Epsom, or Newmarket, or Doncaster celebrity. It was twenty-four miles; and that his majesty might not have to wait unamused when he arrived in the field, the horses had set forward long before, by three divisions, from the starting-point—a short interval of time having been allowed to pass between each set—so that they might begin to come in a few minutes after the monarch had taken his seat. The different divisions arrived at the goal in regular order, but in such a state of fatigue and exhaustion, that their former boasted fleetness hardly exceeded a moderate canter when they passed before the royal eyes.

In almost every book of travels that we read, connected with those countries where the Arabian and his steed are found, anecdotes illustrative of that great admiration and ardour of affection which the rider has for his animal, are abundant. The following are given by Sir John Maxwell:—"An envoy had returned from his mission, and taken up his encampment near Bagdad, when an Arab, riding a bright bay mare of extraordinary shape and beauty before his tent, attracted his attention. The Arab, on being asked if he would sell her, said—'What will you give me?' 'That depends upon her age; I suppose she is past five?' 'Guess again,' said he. 'Four?' 'Look at her mouth,' said the Arab with a smile. On examination she was found to be rising three. This, from her size and

symmetry greatly enhanced her value. The envoy said, 'I will give you fifty tomans,' a coin nearly of the value of a pound sterling. 'A little more, if you please,' said the fellow, apparently entertained. 'Eighty—a hundred.' He shook his head and smiled. The offer at last came to 200 tomans! 'Well,' said the Arab, 'you need not tempt me further; it is of no use. You are a rich *elchee* (nobleman). You have fine horses, camels, and mules; and I am told you have loads of silver and gold. Now,' added he, 'you want my mare, but you shall not have her for all you have got.'"

Who can help admiring the disinterested affection of this semi-savage for his animal! Again—

"An Arab sheik or chief, who lived within fifty miles of Bussora, had a favourite breed of horses. He lost one of his best mares, and could not for a long while discover whether she was stolen or had strayed. Some time after, a young man of a different tribe, who had long wished to marry his daughter, but had always been rejected by the sheik, obtained the lady's consent, and eloped with her. The sheik and his followers pursued; but the lover and his mistress, mounted on one horse, made a wonderful march, and escaped. The old chief swore that the fellow was either mounted upon the devil, or the favourite mare he had lost. After his return he found the latter was the case; that the lover was the thief of his mare as well as of his daughter; and that he stole the one to carry off the other. The chief was quite gratified to think he had not been beaten by a mare of another breed; and was easily reconciled to the young man, in order that he might recover his mare, which appeared an object about which he was more solicitous than about his daughter."

HORSES OF INDIA AND THE EASTERN ARCHIPELAGO.

In India there seems to be a considerable variety of breeds of horses. The performances of a few of the races, whether in the point of speed or bottom, are very far from being contemptible, even when compared with some of our own. In such a climate, where every European must of necessity be mounted, it becomes of importance, for the army as well as civilians, that proper attention should be paid to the selection of the best horses to breed from. Although they are, in general, small, they exhibit all the evidences of having descended from a good stock.

The editor of *The Horse*, published under the superintendence of the Society for the Diffusion of Useful Knowledge, says—

"The Toorky, originally from a Toorkoman and a Persian, is beautiful in his form, graceful in his action, and docile in his temper. It is said that, when skilfully managed, the grandeur and stateliness of his carriage are equal to what the warmest imagination can conceive of the horse; his spirit rising as his exertions are required, he exhibits to his beholders an appearance of fury in the performance of his task, yet preserving to his rider the utmost grace, playfulness, and gentleness.

"Next comes the Iranee, well limbed, and his joints closely knit, and particularly powerful in the quarters, but with scarcely sufficient spirit, and his ears large and loose.

"The patient and docile Cozakee is deep in the girth, powerful in the fore-arm, but with large head, and sadly cat-hammed; hardy, and calculated for long journeys and severe service.

"The Mojinniss have spirit, beauty, speed, and perseverance.

"The Tazsee is slight, hollow-backed, and, for that reason perhaps, although deficient in strength, and leaving as it were his hind legs behind him, and likewise irritable in temper, yet sought after on account of the peculiar easiness of his pace."

A sale of horses, near the Company's stud, at Hissar, is thus described by an excellent judge:—"Not less than 1,000 horses were shown. They were all above fourteen hands and a-half in height, high-crested, and showy-looking horses. The great defect seemed a want of bone below the knee, which is, indeed, general to all the native horses throughout India; and also so great a tendency to fulness in the hocks, that, in England, it would be thought half of them had blood spavins."

A writer in the *Sportsman's Magazine*, expresses himself indifferently upon the qualities of the horses in the East Indies:—

"The small Mahratta horse," he says, "is an active, serviceable little beast; but, in ten cases out of twenty, extremely vicious, but will often make a capital hunter, in fact, being the only horse in India worth his keep; the larger

horses from Hindostan being adapted only for the capering of a native Souwarree. They are leggy, under-limbed, and, as far as vice goes, regular man-eaters.

"The horses from Guzerat and Cutch are certainly endowed with greater amiability of disposition, but are more calculated for purposes of display and parade than for anything else. The natives are very partial to this breed, and give long prices for them—frequently as much as two or three thousand rupees. They blow them out to an enormous size, by feeding them on a composition which must be anything but agreeable to the palate of the horse. This consists of a kind of paste, made of pounded grain and sheep's head, wherewith the poor animal is crammed like a turkey. The end of the flowing tail, generally reaching the ground, is dyed of a deep-red colour; a cruelly sharp bit is put into his mouth; he is buried under a ton of bedding covered with crimson cloth, doing duty for saddle; and, thus caparisoned, he is deemed fit to carry one of the 'pillars of the state.' It is a pretty sight to see a Souwarree, or procession, accompanied by a cavalcade thus mounted. On such occasions, the individuals forming the pageant, take every opportunity of displaying their horsemanship—a cavalier occasionally darting from the crowd at the top of his speed, and as suddenly pulling his horse on his haunches in the midst of his headlong career; then wheeling about, and still at full speed, describing, in an incredibly small space, the difficult figure of eight, with all the apparent ease of a graceful skater."

It is unnecessary to specify the excellences of some of the individual horses which have acquired celebrity in this country. It is enough to say that, generally, they have been found possessed of sufficient stoutness to carry the Mahratta warriors through the turmoil of many a hard-fought day, before their power was broken by the fall of Seringapatam, or the death of Tippoo Saib, in 1792. The Mahratta army was principally composed of cavalry; and to see a troop of them, with their knees as high as the backs of their horses; their heels firmly adhering to the horses' sides, and their hands clinging to the manes or the peaks of their saddles, is anything but a graceful specimen of horsemanship. His seat, however, is made perfectly secure by the Mahratta; for, like practice in everything else, he becomes, as it were, "to the manner born," and feels sufficiently safe in his seat to impress those who see him with the idea that he is both secure and comfortable.

Most of the horses in the East are picketed during the day, as well as during the night; and a rope is carried from each side of the head-stall, and fastened to a peg driven into the ground. To the hinder fetlocks a rope is also tied and fastened to a peg, twenty or thirty yards behind the animal. Their eyes are kept covered, and their bodies clothed in such a way as to preserve the beautiful glossy appearance of their coats.

In the caparisons of his horse the Mahratta displays the usual Oriental taste for show and magnificence. The breast of the animal is adorned with especial splendour; and numerous coins of different sizes and value are fashioned into plates, which hang and glitter from his breast, and very often form a rich booty to his conqueror. The mane is usually plaited and braided with silk, decorated with silver knobs, and terminating in a beautiful top-knot rising between the ears. Should the warrior happen to have distinguished himself against his enemies, a few curious tails, said to have been taken from the wild cow, very likely will be found hanging on each side.

With this Eastern region the imagination naturally associates everything that is vast, not only in regard to the physical features of the country, but in regard to the riches it possesses, and the undertakings of its inhabitants. Its rivers are amongst the largest in the world, and its mountain-peaks are the loftiest; its plains the most extensive, its valleys the most luxuriant, and its forests realising all "the pomp of groves" described by the poet. It is called by Milton "the gorgeous East," which showered on her kings barbaric pearl and gold; and is the country of the largest as well as the fiercest of quadrupeds. It has given to the world the most magnificent bird—the peacock—of all the feathered tribes; and has, also, in the institutions of its people, exhibited more instances of gross superstition, revolting cruelty, and deep degradation, than any land on the face of the earth. Its horses, however, are inferior to the English breed. Even its

imported Arabians succumb to the stamina of our "islanders," which are now, unquestionably, the finest animals in the world.

To the east of our Indian empire, in Burmah, Siam, and China, horses are yet of a smaller breed; and those of China are usually poor-spirited, meek, and not well made. In Moore's *Notices of the Indian Archipelago*, we are assured that, in every country lying to the east of the Burrampooter, and south of the tropic, the horse, however diversified, is little better than a pony. "This fact," says a writer in the *Museum of Animated Nature*, "after quitting Bengal, is first noticed in the countries of Cassay, Ava, and Pegu. Here the horse seldom equals thirteen hands high; but is active, spirited, and well formed. As we proceed to the south and west, the horse becomes more diminutive; and those of Lao, Siam, and the southern provinces of China, are inferior in size and beauty to those of Ava and Pegu. The Siamese and Cochin Chinese have no cavalry, and make no use of their ponies, except for riding, on ordinary occasions. Even for this last purpose they are not esteemed, the elephant being always preferred as a more respectable and dignified mode of conveyance. In the Malayan peninsula there are no plains or roads; and the inhabitants, living almost exclusively on the low and woody banks of the rivers, naturally substitute their canoes and boats for beasts of carriage and burden; and hence the horse has not yet been naturalised amongst them. Proceeding eastward in the Malayan islands, the horse first occurs in the interior of Sumatra; and here we have two of the best breeds known in those countries—the Achin and Batta, both very spirited, but small and better suited for draught than saddle.

"Of all the countries of the Archipelago, the horse is most frequent in the island of Java. The Javanese pony is generally larger than that of Sumatra, and has more the form of a horse—is more temperate, and less gay and handsome. Two distinct races may be described—one of the plains, and one of the mountains. The first is somewhat coarse, and sluggish in disposition, and so large as occasionally to reach the height of thirteen hands and an inch. The second is small and hardy, and, as in the case of the Kuninghan—a breed in the interior of Cheribon—sometimes very handsome, and giving great pleasure to the eye by his general appearance."

In Java the horse is used both for the saddle and as a beast of burden; but the natives never use him for agricultural purposes, or, indeed, for any species of draught. By Europeans, however, he is extensively used in carriages; and on the level and well-constructed roads of Java, four of them will draw a carriage at the rate of twelve, and even fifteen miles an hour. There is, however, no real advantage in employing this diminutive breed for such a purpose, as a pair of English post-horses, on the same roads, will go as far and as fast without the slightest difficulty. To accomplish this in a carriage of the same weight as the English horses would draw, would require twelve Javanese ponies. One horse, therefore, is equal to six ponies; and as, at the utmost, a full-grown horse will not consume above twice the quantity of food required for a pony, the charge of maintaining him, in proportion to the work he is capable of performing, is no more than one-third.

The horse, but of an inferior breed, is found on the islands of Bali and Sombolk; also in the island of Samharra, where there are two different races—those of Samboro and Bima. The last, especially those of Gunong Api, are by far the handsomest breed of the Archipelago, and are extensively exported. Passing Samharra, the horse is traced to Flores, Sandal-wood island, and Timor; but nowhere further to the east, being unknown in the Moluccas, New Guinea, and the neighbouring islands. Next to Java,* the horse is found in greatest

* This is the finest and most valuable island of the Indian Archipelago, and is divided, nearly in its whole length, by a range of volcanic mountains, attaining the height of 8,000 feet above the sea. This range approaches nearest the southern coast, rising into high and rugged hills, against which the surf dashes violently; so that, with the exception of a few bays, where a landing on the island can be obtained, it is otherwise inaccessible. On the northern side of this mountain ridge the surface is low and swampy, intersected by a great number of rivers and fine bays, where good anchorage is obtained, in moderate depth, during the south-east monsoon. The mouths of all the rivers, however, are choked up with mud or sand-banks; and when they are swelled by the torrents, they inundate all the low lands. The eastern extremity of the island is but thinly inhabited, and very little cultivated. All the European settlements are on the northern coast; but a magnificent military road, con-

abundance on the Celebes, the breed of which is, on the whole, pronounced the best in the Archipelago.

Within the Eastern Archipelago, as in other parts of the world, the colour of the horse has a singular connection with temper, quality, and locality. The prevailing colour of the Archive ponies is piebald, which becomes rarer and rarer as we proceed eastward. A Bima pony of this colour is as rarely seen as a black Arab. The prevailing colour of the Batta pony is bay and mouse-colour. In Java the best horses are those of the most prevalent colours—namely, bays and greys; the roan and mouse-coloured horses are very generally good. The worst colours are black and chesnut. The Javanese have such a dislike to the latter colour, that chesnut horses are not permitted to appear at their public tournaments. Bays, greys, and duns, are the best and most frequent colours in the Bima ponies. Blacks and chesnuts are not frequent, but they are not considered inferior. Greys and bays prevail among the ponies of Celebes and the Philippines, nearly to the exclusion of all others. In the plains of Celebes herds of wild horses exist—no doubt the descendants of a domesticated stock.

Of the speed of the Arab horses in India, we have the following account of an extraordinary match, for 1,000 rupees, which arose out of a conversation amongst several officers in one of the performances of the late Mr. Osbaldeston. The distance to be run was seventy miles in four hours and ten minutes, and the number of horses was to be unlimited.

Eleven horses, the number which it was proposed to employ in the match, were, in the course of a couple of days, mustered by the parties and their friends, and were exercised every morning on the race-course here for the short time intervening between the making and coming off of the match.

The backers of Old Time were numerous; and, in fact, the general opinion was that the match would not be won: the grounds for which were, that the roads were known to be in a bad state; that the Bore Ghaut, a steep and winding descent of four miles, with a precipice on one side of the road, had to be passed; added to which, was the probability, nay almost certainty, of obstruction from the droves of bullocks carrying grain up the country, with which the road is usually at this season thronged. It was, moreover, supposed that the horses in training were by no means equal to the performance; and that an accident, of which there appeared more than a probability, would infallibly lose the match.

From the confidence of the parties themselves, however, the betting, at starting, was even on the match being performed in four hours ten minutes; three to two against four hours; three to one against three hours fifty minutes; and ten to one that it was not won in three hours and thirty minutes.

On the first making of the match, two watches on the chronometer principle, which had been selected for the occasion, had been placed in the hands of a watchmaker; and these having been set on the day preceding the match, one was taken on in the mail to Pauwell by the umpire, whilst the other was reserved for the start at Poona.

At a quarter past five o'clock in the morning of the day appointed for the event to "come off," Mr. Rawlinson, riding twelve stone, appeared at the starting-place; and the word "off" having been given, the match commenced.

Only one, and that not a very large drove of bullocks, was met between Poona and Rhandalla; the distance, forty-four miles, having been performed in exactly two hours, without any accident having occurred. Here a violent horse had been injudiciously stationed; and

structed by the Dutch, traverses the whole length of the island. For upwards of a century the Dutch remained in undisturbed possession of Java, where, however, their rule was most oppressive and odious to the natives; but in August, 1811, a British force took by storm Batavia, their capital, and the whole colony subsequently surrendered. Under the government of Sir Stamford Raffles, whose memory is held by the inhabitants in affectionate veneration, the prosperity of the island rapidly increased. But in 1816 it was restored to its former masters.

The population is estimated by the British surveys at more than 5,000,000. The inhabitants consist of Javanese, who inhabit the interior parts, and are in general the cultivators of the soil; Malays, Chinese, Dutch, English, and mixed castes. The Chinese are shopkeepers and traders. The Malays are altogether a servile race, and are the servants and drudges of the colonists. The Javanese are of the Hindoo family, their language being a dialect of the Sanscrit; and their religion is Mohammedanism, which they embraced about three centuries ago.

immediately on his being mounted, the curb turned round in his mouth, and he ran away with his rider the whole way down the Ghaut; but luckily was, after two or three narrow escapes, pulled up safe at Kolapoor. The last horse, when within a couple of miles of home, suddenly leapt off the road into the fields, and alighting on bad ground, fell. No injury, however, was sustained by either horse or rider, who immediately remounted, and arrived in Pauwell at twenty-eight minutes to nine o'clock—thus winning the original match with fifty-three minutes to spare.

The horse which ran between Wargaon and Carli, was the only one of those employed in the match which had ever appeared on the turf.

The match was ridden with great nerve and judgment throughout by Mr. Rawlinson, son of Mr. Rawlinson, of Chadlington, Oxfordshire; and the horses were Arabs belonging to the officers.

THE TOORKOMAN HORSE.

Turkistan is that part of South Tartary north-east of the Caspian Sea; and has been celebrated, from early times, for producing a pure and very valuable breed of horses. They are called Toorkomans; and are said to be preferable even to the pure Persians for service. They are large, standing from fifteen to sixteen hands high; swift, and inexhaustible under fatigue. Some of them have travelled 900 miles in eleven successive days. They, however, are somewhat too small in the barrel; too long on the legs; occasionally ewe-necked, and always have a head largely out of proportion; yet such are the good qualities of the animals, that one of the pure blood is worth two or three hundred pounds, even in that country.

The inhabitants of this country generally lead the same sort of life as their ancestors, being nomades, or wanderers. They dwell in tents, which are removed from place to place as their lands become exhausted and pasturage fails to supply them with their necessities, or as they themselves "increase and multiply," and their flocks become too numerous; when, like Abraham and Lot, they separate—the one party going to the right, and the other to the left. The flesh of the sheep and the horse forms their chief article of subsistence; for, as the poet says, the Tartar first rides his horse, then eats him. To him the horse is, of all animals, the most valuable. What the camel is to the Arab, and the reindeer to the Laplander, the horse is to him the prime source of his wealth.

Captain Fraser, in his journey to Khorassan, thus relates the impression which these horses made on him:—"They are deficient in compactness; their bodies are long in proportion to their bulk; they are not well ribbed up; they are long on the legs; deficient in muscle; falling off below the knee; narrow-chested; long-necked; head large, uncouth, and seldom well put on. Such was the impression I received from the first of them, and it was not for some time that their superior valuable qualities were apparent to me."

Mr. John Lawrence says, that it is related, on the authority of a certain Prussian count, that a German prince having, with the utmost care and expense, raised a most valuable breed of horses from a son of the well-known English racer, Morwick Ball, it was one of the first imperial acts of Napoleon I. to honour the proprietor with a military order to have the whole of them marched to France, which was promptly executed.

On the same authority it is stated, that an Arabian horse was obtained in Germany (probably by the way of Turkey and Hungary), which proved superior, for the beauty, strength, and worth of the stock he produced, to any which had been before known in that country.

The name of this famous stallion was Turkmainatti, a name in equal estimation, in Germany, with that of the Godolphin Arabian in England. The valuable stock of this horse has spread over the country; and young Turkmainatti, some time, ably supported the honour of his family.

It is not unreasonable to suppose that this horse was a native of the country we have just been describing, instead of an Arabian. It is, however, from Arabian sires that the Toorkomans trace their breed.

THE TURKISH HORSE.

The Turkish horse is descended principally from the Arab, crossed by the Persian and certain other bloods. The body, however,

is even longer than the Arabian's, and the crupper more elevated. He has contributed materially to the improvement of the English breed. The Byerley and the Helmsley Turk, are names familiar to every one conversant with horses, and connected with our best blood.

Asiatic Turkey is the largest and most valuable portion of the Ottoman empire, occupying the central part of the temperate zone in the west of Asia. He has no country more interesting, and few richer in historical remembrances, whether sacred or profane. The garden of Eden is, by many topographical writers, supposed to have been situated between the point where the junction of the Tigris and the Euphrates takes place, and the Persian Gulf; hence it becomes the reputed scene of the primitive creation of man. Here, according to them, Adam and Eve were, in a state of innocence, placed.

"His fair large front and eye sublime, declared
Absolute rule; and hyacinthine locks
Round from his parted forelock manly hung,
Clustering, but not beneath his shoulders broad;
She, as a veil, down to the slender waist
Her unadorn'd golden tresses wore
Dishevell'd."

Both Europe and America received from this land their religion and their letters; the former from Palestine, and the latter from Phœnicia; and the principal events in the life of our Saviour, took place within its boundaries.

The inhabitants of a country so eminent in renown, and so high in arts and civilisation, must, at a very early period, have had the horse reduced to a state of domestication. Here was the Assyrian empire, one of the greatest of antiquity; and here Nineveh, its capital, was laid waste in accordance with the denunciations of the prophet Nahum. From these remote times, the Turkish horse has been a prominent object in war; and no animal has a more majestic, a more noble and brilliant appearance when carrying his rider, and exhibiting his costly caparisons.

Evelyn, the author of *Sylva*, thus describes one of these animals which had been sent over to England in the reign of Charles II., and which he seems to have been fortunate enough to have seen. "I never beheld so delicate a creature!" he exclaims; "somewhat of a bright bay, two white feet, a blaze; such a head, eyes, ears, neck, breast, belly, haunches, legs, pastern, and feet; in all respects beautiful, and proportioned to admiration; spirited, proud, nimble, making halt, turning with that swiftness, and in so small a compass, as was admirable." The learned and benevolent Busbequius, who was ambassador at Constantinople in the seventeenth century, is equal to Evelyn in his admiration of the Turkish horse.

"There is no creature so gentle as a Turkish horse, nor more respectful to his master, or the groom that dresses him. The reason is, because they treat their horses with great lenity. I myself saw, when I was in Pontus, passing through a part of Bithynia called Axilos, towards Cappadocia, how indulgent the countrymen were to young colts, and how kindly they used them soon after they were foaled. They would stroke them, bring them into their houses, and almost to their tables, and use them even like children. They hung something like a jewel about their necks, and a garter, which was full of amulets against poison, which they are most afraid of. The grooms that dress them are as indulgent as their masters; they frequently sleek them down with their hands, and never use a cudgel to bang their sides, but in case of necessity. This makes their horses great lovers of mankind; and they are so far from kicking, wincing, or growing untractable by this gentle usage, that you will hardly find a masterless horse amongst them.

"But, alas! our Christian grooms' horses go on at another rate. They never think them rightly curried till they thunder at them with their voices, and let their clubs or horsewhips, as it were, dwell on their sides. This makes some horses even tremble when their keepers come into their stable; so that they hate and fear them too. But the Turks love to have their horses so gentle, that at the word of command they may fall on their knees, and in this position receive their riders.

"They will take up a staff or club upon the road with their teeth, which their rider has let fall, and hold it up to him again; and when they are perfect in this lesson, then, for credit, they have rings of silver hung on their nostrils, as a badge of honour and good discipline. I saw some horses, when their master

was fallen from the saddle, stand stock still, without wagging a foot, till he got up again. Another time I saw a groom standing at a distance, in the midst of a whole ring of horses; and I saw some horses, when their master was at dinner with me in an upper room, prick up their ears to hear his voice; and when they did so, they neighed for joy."

There can be no doubt that the law of kindness, constantly operating upon the horse, has the best possible influence on the disposition of the animal, and inspires him with sentiments of a correspondingly amiable description. The Turks have him so docile and tractable, that they do not hesitate to play at ball, with a goff-stick, on his back. This game is played both in Turkey and Syria, and proves the perfect state of training to which the horse has been brought, as the smallest touch of the bridle makes it wheel, gallop at full speed, or suddenly stop, as the will of the rider commands.

In Syria, and other parts of western Asia, the horse is fed upon chopped straw and barley; and of this provender a certain quantity is given morning and evening, none being supplied in the interim. "In the spring season, the horses are fed, from forty to fifty days, on green barley, cut as soon as the corn begins to ear. This is termed lying down to grass; during which time the animals remain constantly exposed in the open air; and for the first eight or ten days are neither curried, mounted, nor led about. After this they are dressed as usual, and rode out gently; but are never much worked during the grass season. Some feed the horses with cut barley in the stable-yards; but the general practice is to confine them to a certain circuit by means of a long tether, in the barley-field. This grazing is considered of great service to the health of the horse, and imparts a beautiful gloss to his coat."

Everywhere in Asia Minor, as well as in Arabia, Persia, and neighbouring countries, we meet with anecdotes which indicate, to an extraordinary extent, the affection which the natives bear for the horse. Burchardt relates a story which, whilst it places the speed and endurance of one in an eminent point of view, at the same time, shows how even an enemy will express his admiration of an animal ridden by his foe. "A troop of Druses* on horseback, attacked, in the summer of 1815, a party of Bedouins, and pursued them to their encampment; the Bedouins were then assisted by a superior force; and becoming the assailants in their turn, killed all the Druses except one, who fled. He was pursued by some of the best mounted Bedouins; but his mare, although fatigued, could not be overtaken. Before his pursuers gave up the chase, they called to him, and begged to be permitted to kiss his excellent mare, promising him safe-conduct for her sake. He might have taken them at their word; for the pledge of an Arab, in such circumstances, might have been relied on; he, however, refused. They immediately left the

* Of the various tribes inhabiting Syria, some are indiscriminately found everywhere, whilst others are confined to particular sites. The *Greeks proper* people certain villages, and form a class of labourers for the country, and drudges for the towns. In many respects they resemble the Irish, and are, like them, "the hewers of wood and the drawers of water." The Maronites form a corps of the nation which occupies almost exclusively the territory comprised between Nahr-el-Kelb and Nahr-el-Bared, a region extending from the summit of the mountains on the east, to the Mediterranean on the west. The bordering tribes, the Druses, occupy the space from Nahr-el-Kelb to Sour, the ancient Tyre. The country of the Metualis comprehends the valley of Becka, as far as Sour. But this tribe is now dispersed, and likely to become extinct. As for the Ausarichs, they are scattered over the mountains of Autakieh, chiefly in the pashalic of Tripoli. The wandering or pastoral tribes abound principally in the plain of Antioch; the Kurds, in the mountains situated between Alexandretta and the Euphrates; and the Bedouin Arabs, on all the frontier of Syria adjacent to their deserts, and in the plains of Palestine. The nation is divided into two classes; the people, and the Cheiks or nobles. They live in the mountains, villages, hamlets, and isolated houses. The country is essentially agricultural; each inhabitant has the right over his own farm or pasturage; the Cheiks are only distinguished from the other natives by a variety in their dress. In other respects they have the same rights and privileges. Among the Maronites there are neither mendicants nor robbers, as among the Arabs; and both by day and night the traveller may pursue his course unmolested. They are monogamous; and, like the Persians, choose their wives without seeing them. Although Christians, they preserve the Arabic custom of the tahori; and the next of kin of the man assassinated, has the right of taking his revenge. According to a recent census, the Maronite population is estimated at 120,000 souls, of whom the men bearing arms amount to 30,000—a considerable population for a district measuring some 150 square miles, and abounding in rocks, and all the beauties of natural scenery.

pursuit, and blessing the noble beast, cried out to the fugitive, 'Go and wash the feet of your mare, and drink off the water.' This expression is often used by the Bedouins to show the regard they have for their mares."

Some of the Turkish, as well as Toorkoman horses, incline to have white legs, against which there is a prejudice held by a great many English grooms—on what account we are not aware, as the celebrated horse Bucephalus, of Alexander the Great, we believe was a skewbald. A writer in the *Sporting Magazine* thus combats this prejudice:—"Turn to the banks of the Euphrates—to the decayed, but once splendid seats of the caliphs of the Black Banner—to the cradle of the Arabian Tales—to the Queen of the East, Bagdad, the beloved capital of the great Haroun al Rasched—and there we have a breed of horses uniting the fire of the Persian, with the symmetry and enduring qualities of the desert breed. Go further to the southward; cross the great river; roam among the settled tribes who have pitched their tents on the very verge of civilisation, near unto the great cities, the dwellings of slaves, as they are not inaptly termed by the Bedouins; and you may lay your hands on the flowing manes of a race of horses—all chesnut, with the starting prominent eye like an ember glowing, 'full of fire and full of bone,' and all singularly and invariably stamped with the peculiar distinctive marks of their caste—the white blazed face and white legs (generally three); white up to the knee—perhaps the ancestors of the great Eclipse; a chesnut also, with these remarkable marks, and which sometimes break forth in his most distinguished descendants—to wit Sultan, his son Beiram, Harkaway, and a number of winners of our great stakes."

The Turkish horse is sometimes harnessed to carriages, in the Ottoman empire, where the art of coach-building is still in its infancy—a circumstance which is accounted for by the sedentary character of Turkish habits. The secluded manner of life to which the women of this country are subjected, applies also to the habit of the head of the family himself. As for journeys or promenades, they are in accordance with the jealous manners of the people, who restrict their rambles to parks or secluded retreats in the environs of mansions. In consequence, carriages are so rarely used that they are comparatively useless; nevertheless, they are to be found as accessories to the best establishments, where they are employed to convey the ladies from the harems to the mosques, to the public baths, and the resorts of pleasure, possessed by the richest Turks in the environs of their residences, or to their country seats in the neighbourhood. For such purposes it is not necessary that the carriages should be of substantial build, similar to those subjected to the wear and tear of London streets. It is, in general, one of these slim vehicles, with its *daïs* covered with drapery, and with decorations, reminding us of the French carriage of the seventeenth century.

The Turks prefer horses for riding; whilst the Arabs prefer mares. According to Burchardt, the price of an Arab horse, in 1810—1816 was from £10 to £120. Some, however, have brought £500; and Burchardt mentions a sheik who paid £400 for a mare, and agreed to give to the seller the first female colt she produced, or to keep the colt and return the mare.

THE CIRCASSIAN HORSE.

On the plains of Circassia, large herds of horses, and flocks of sheep, are reared for purposes of commerce by the Tcherkesses. The most valuable breed of the former has a considerable amount of both strength and speed; and is distinguished by having a mark upon it, of a full horse-shoe. Each breed has some peculiar mark; to forge which, or place it on an inferior animal, is punishable with death. Most of the wealthiest families make it their aim to have a peculiar breed of horses for themselves, and, in their own estimation, consider it as excelling that of any other tribe.

THE RUSSIAN HORSE.

The Russian empire comprises all the north part of Asia, and a large portion of Europe. In point of physical extent, it is the largest empire in the world, embracing an area extending from the 18th to the 170th degree of east longitude, and from about the 44th degree of north latitude to the Frozen Ocean. In a country so extensive, it is not to be expected that the horse presents, to our observation, the same features in one place, that it does in

another. Those animals devoted to the purposes of pleasure, as well as those which form the heavy cavalry, are, originally, mostly the descendants of Cossack blood, but greatly improved by having been crossed with Poland, Prussian, Holstein, and English blood. The horses forming the lighter cavalry, are, as they have ever been, mostly Cossacks, which have never been tried to be improved, but which are, nevertheless, extremely hardy, capable of considerable endurance, and well adapted for the duties they have to perform. For a long period it was believed that no horse, except the Arab, was equal to the Cossack for bearing privation, and, at the same time, uniting with this quality so great an amount of speed as it has been found to possess. In 1825, however, the contrary was proved. Two Cossack horses were selected from the best breeds on the Black Sea, the Don, and the Ural, and run against two English ones, which greatly excelled the others both in speed and stamina. On this occasion, the English horses were not of the best breed, and were named Sharper and Mina. The account given of this trial of speed and endurance, shows that it was attended with circumstances the very reverse of such as we should wish to be the accompaniment of similar contests.

"On the 4th of August, 1825, on the challenge of the Cossacks, a race, of the cruel distance of forty-seven miles, out and home, was agreed to. The four horses to start together; and the first in, to take the whole stakes.

"On starting, the Cossacks took the lead at a moderate pace—the English horses following, at the distance of three or four lengths; but, before they had gone half a mile, the stirrup-leather of Sharper broke, and he ran away with his rider, followed by Mina; and they went more than a mile, and up a steep hill, before they could be held in.

"Half the distance was run in an hour and four minutes Both the English horses were then fresh, and one of the Cossacks. On their return Mina fell lame, and was taken away. The Cossack horse, likewise, began to flag, when the accompanying Russian began to drag him on by the bridle, throwing away the saddle, and putting a mere child on his back. Sharper, likewise, evidently showed the effects of the pace at which he had gone when running away, and was much distressed. The Cossacks then had recourse to foul play, and actually carried on their horse—some dragging him on by a rope, and the bridle at his head; others pulling him forward by the tail; whilst others kept alongside of his quarters to support him; and they relieved each other at this fatiguing work. Sharper did the whole distance in two hours and forty-eight minutes; and the Cossack horse was *warped* in, eight minutes after him. At starting, the English horse carried three stone more than the Cossacks; and, during the latter half of the race, a mere child had ridden the Cossack."

The barbarous cruelty displayed by the Muscovites in this contest, with the unfairness of their whole proceedings, require no comment. They were chagrined at being defeated, and wreaked their ill-feeling upon their animal, because he had not more strength than had been given him by nature.

The last Czar Nicholas was as anxious for the improvement of the Cossack horses, as he was for the general development of the resources of his country; and, with that view, instituted races in different parts of his empire. In southern and western Russia, landed proprietors have recently devoted much of their attention, not only to the horse, but to cattle, endeavouring to bring up their various breeds to as high a state of perfection as they can. Russian noblemen, now, have generally large stables; and the stud of the Russian Countess Orloff Tshesmensky alone, was composed of 1,320 Arabs, English, natives and others. The ground, attached to this stud, comprised nearly 1,100 acres; and the number of grooms, labourers, and others, amounted to 4,000. The better breed of the Tartar horse is sketched by Berenger, in his *Treatise on Horsemanship;* and although this species would seem to be but of a moderate stature, still they are strong-spirited, bold, and active. They have good feet, but narrow; and their heads are lean and well-shaped. Their fore-hand is long and stiff; but the legs are over-long. With all these imperfections, however, they are good and serviceable horses, endowed with great speed, and not readily succumbing to labour. They are reared in a manner similar to those of the Arabs—being caressed and fondled, and made companions of. When they are six or eight

months old, the Tartars make their children ride upon them; exercise them in small excursions; dress, and, by degrees, reduce them to gentle habits of domestication. After awhile they are made to undergo hunger, thirst, and other privations; but men do not begin to ride them until they have reached their fifth or sixth year. Then they are mounted by their masters, who exact from them the severest duties, and who gradually inure them to support an almost incredible degree of fatigue. They are made to travel two or three days at a time, almost without resting, and pass four or five days without better nourishment than a handful of grass, and without water.

Such are the principal portions of the mode in which the Tartars train their horses, as given by Berenger. The discipline is certainly severe. In the *Mazeppa* of Lord Byron, we have a beautiful description of a kindred animal to that of the Tartars in the Ukraine:—

"The steeds rush on in plunging pride,
But where are they the reins to guide?
A thousand horse, and none to ride!
With flowing tail, and flying mane,
Wide nostrils—never stretch'd by pain—
Mouths bloodless to the bit or rein,
And feet that iron never shod,
And flanks unscarr'd by spur or rod—
A thousand horse, the wild, the free,
Like waves that follow o'er the sea.
On came the troop. * * *
They stop, they start, they snuff the air,
Gallop a moment here and there,
Approach, retire, wheel round and round,
Then plunging back with sudden bound,
They snort, they foam, neigh, swerve aside,
And backward to the forest fly."

This description is applicable to the wild horse, as he is witnessed in his native state, and when we can hardly imagine a scene more sublime than a thousand of his kind, bounding over the vast steppe, with their manes streaming in the wind, until the whole troop is lost in the distance.

THE SWEDISH HORSE.

Mr. Lloyd, in his *Field Sports of the North of Europe*, says, that "the Swedish horses are small, though hardy, and capable of considerable exertion; their manes and tails are usually left in a state of nature; they are seldom cleaned; and, when in the stable, even in the most severe weather, are rarely littered down. This treatment of their horses arises as much from ignorance as neglect on the part of the peasants. In saying this, however, I am willing to admit that many of them are almost as fond of these animals as if they were their own children. The average price of a good horse, of the description I am now speaking of, may be taken at from five to eight pounds."

The horse of this country is fed almost entirely on bread, composed of equal parts of oatmeal and rye. To this a considerable quantity of salt is added: if setting out on a long journey, a little brandy is given him. Sir A. Brooke, in his *Travels in Sweden*, says—"We were not a little entertained at the curious group formed by the peasants and their steeds breakfasting together; both cordially partaking of a hard rye cake. The horses sometimes belong to three, or even more proprietors; it is then highly amusing to observe the frequent altercations between them, each endeavouring to spare his own horse. Their affection for their horses is so great, that I have seen them shed tears when they have been driven beyond their strength. The expedition, however, with which these little animals proceed, is surprising, when we consider the smallness of their size, which hardly exceeds that of a pony. The roads being universally good through Sweden, they frequently do not relax from a gallop from one post-house to another."

In the Scandinavian forest, it often happens that the wild bear attacks the horse, and, fastening upon him, is borne along by the animal whilst writhing under the wounds inflicted by the claws of the ursine monster. When this is the case, the bear tries to retard the progress of the horse by grasping with one of his paws at the surrounding bushes, which he often, under such circumstances, tears up by the roots. Should he succeed, however, in catching hold of a tree that is firmly embedded in the soil, it is then all over with his victim; for, owing to his immense muscular power, the career of the horse is at once stopped, and he is almost immediately brought to the ground.

It seems rather extraordinary that so clumsy and ill-shaped a looking brute as a bear, should be able to run down a horse; but such, whether owing to the fears of the animal, or to the advantages of ground, is, beyond doubt, of every-day occurrence. Until he has brought his

victim down, however, it is said, the bear seldom makes use of his teeth; but he strikes his victim on the back and sides with his terrible paws, in the same manner as if with a sledge hammer. Sometimes, however, the horse, by flinging out behind, makes his escape; for it is not an uncommon circumstance for a bear to be killed, and found *minus* an eye or a fang, which the peasants suppose, and with some reason, has probably been caused by the heels of horses.

The wounds which the bear inflicts upon cattle, when he attacks them, are sometimes dreadful to look upon. Mr. Lloyd says that he saw a horse that had been within the clutches of one of these monsters, some few days previously, but from which he had been rescued, owing to an accidental circumstance. In the back and neck of the poor steed, were holes of such a size, that, without exaggeration, he could almost have buried his hand in them; this horse, however, died a few days subsequently.

The sufferings of animals, when attacked by a bear or other wild beast, must often be dreadful. Nearly the whole of the hind-quarters of a cow, or a horse, have been actually devoured, and yet the poor creatures have been found alive.

THE LAPLAND HORSE.

The Laplanders are comprised in two distinct classes, differing entirely from the Swedes in points of person, habits, and language. They consist of a nomadic and a settled class—the one pursuing a wandering life, and the other living in towns. The reindeer is both their solace and their wealth; but they are possessed of a small, eager, and willing species of horse. This little creature is employed in drawing sledges over the snow in winter, and, in summer, is turned into the forests, where he selects certain districts to feed in, and from which he rarely wanders. When these districts no longer supply him with pasture, from the change of the season having set in, he voluntarily returns to his master to be re-yoked to the sledge, or to draw wood for the winter.

To be present in an encampment of Swedish Laps, when preparing to milk their "Reins," or deer, is one of the most exciting scenes that can be presented to human observation.

The herd is driven within the inclosure, and all outlets guarded. The first thing to be done is to secure the restive reins. Selecting a long thong or cord, a Lap takes a turn of both ends round his left hand, and then gathers what sailors call the *bight* in loose folds held in his right. He now singles out a rein, and throws the bight with unerring aim over the antlers of the victim. Sometimes the latter makes no resistance; but, generally, no sooner does it feel the touch of the thong than it breaks away from the spot, and is only secured by the most strenuous exertions of its capturer. Every minute may be seen an unusually powerful rein furiously dragging a Lap round and round the inclosure, and occasionally fairly overcoming the restraint of the thong, and whirling its antagonist prostrate on the sod. This part of the scene is highly exciting; and one cannot but admire the great muscular strength and the trained skill evinced by all the Laps, women as well as men, who happen to be engaged in it. The resistance of a rein being overcome, the Lap will take a dexterous hitch of the thong round his muzzle and head, and then fasten him to the trunk of a prostrate tree, which, with many other trees, has been brought within the level inclosure for that special purpose. Even when thus confined, some of the reins plunge in the most violent manner. Men and women then indiscriminately engage both in singling out milk-reins, and in milking them. A wooden bowl is held in the operator's left hand, and he then slaps the udder of the rein, several times, with the palm of the right hand. After this he moistens the tips of his fingers with his lips, and then rapidly completes the operation. The amount of milk yielded by a single rein is, noticing only bowls which had not previously received contributions, little more than a gill; others give at least double, and a few thrice that quantity; but the fair average is about half a pint.

This milk is as thick as the finest cream from the cow, and is luscious beyond description. It has a pleasing aromatic smell, and, in flavour, reminds us most strongly of cocoanut milk. No stranger can drink much of it at a time—it is too rich. When the rein is milked, the operator takes up a small portion of a particular species of moss, and carefully wipes the drained udder and teats with it; and,

from time to time, the bowls are emptied into the kits, &c.

It is impossible to give an adequate idea of the impressive, exhilarating appearance of the whole inclosure. Every soul seems, at this time, fully occupied, for even the little Lap children are practising the throwing of the lasso, and evincing great dexterity, although their strength is insufficient to hold the smallest doe. Many of the young reins attempt to suck the parent doe, but are always beaten away by the Laps. Great quantities of the loose hair on the backs of the reins, at this season fall to the ground at a touch. Of these the women form beds, on which to stretch their reindeer skins, and thus save them from contact with the mud floor of the huts.

THE NORWEGIAN HORSE.

Norway is one of the most mountainous countries in the world, and possesses a larger breed of horses than Sweden. Of their sagacity and affection, the following story may be taken as a proof:—The master of one of these animals had been dining at the neighbouring town, and, when it was time to return, had drank so much that he could not keep a firm seat in his saddle. The horse seemed to be aware of his master's condition, for he regulated himself, as well as he could, according to the unsettled motion of his rider; but, happening to make a false step, his master rolled off his back, and hung with one foot entangled in the stirrup. The horse immediately stopped, and, twisting his body in various directions, endeavoured to extricate him, but in vain. The man was severely hurt, and almost helpless; but the shock had brought him to his senses. The horse looked at him as he lay on the ground, and, stooping, laid hold of the brim of his hat, and raised his head a little; but the hat coming off, the man fell again. The animal then laid hold of the collar of his master's coat, and raised him by it so far from the ground that he was enabled to draw his foot out of the stirrup. After resting awhile, the man regained the saddle, and reached his home. Gratitude towards the preserver of his life, made the man ever afterwards cherish the horse with the utmost kindness, until old age brought the termination of its career.

In Norway, as in Sweden, the horse is sometimes attacked by bears; and if he happen to have a mare or foal with him, he places either behind, and then attacks the others with the utmost fury with his fore-legs. When he adheres to this mode of beating off his enemy, he is generally successful; but if he turns round to strike with his hind legs, the bear immediately runs into him, and he is lost.

In Iceland there is said to be a breed of horses, descended either from the Norwegian or the Scotch.

In Finland, there is also a breed of horses which are said to be beautifully formed, and very swift, although not more than twelve hands high.

THE DANISH HORSE.

The Danish horses are of such an excellent size, and of so strong a make, that they are preferred to almost all others for draught. There are some of them perfectly well shaped; but this is but seldom seen, for, in general, they are found to have a thick neck, heavy shoulders, long and hollow back, and a narrow croup; however, they all move well, and are found excellent both for parade and war. They are of all colours, and often of whimsical ones; some being streaked like the tiger, or mottled like the leopard. A good many years ago there was an importation of some Danish horses in London, which were considered to have good action, and to be very serviceable.

Of the horses belonging to the Feroe Islands, subject to the Danish crown, Berenger thus speaks:—"They are small of growth, but strong; swift, and sure of foot, going over the roughest places with such certainty, that a man may more surely rely upon them than trust to his own feet. In Suderoe, one of these islands, they have a lighter and swifter breed than in any of the rest. On their backs the inhabitants pursue the sheep, which are wild in this island. The pony carries the man over places that would otherwise be inaccessible to him; follows his rider over others; enters into the full spirit of the chase, and knocks down and holds the prey under his feet until the rider can take possession of it."

THE FLEMISH OR DUTCH HORSE.

The Flemish horses are a large race, and powerfully formed. They were once fashion-

able in this country as carriage-horses; but they and their descendants are now chiefly employed in agriculture.

THE FRENCH HORSE.

In France, horses of the Bretagne (Brittany) breed are strongly made, and have, generally, black hair, or brown bay; good legs and feet, with a hardy mouth, and a head short and clumsy. The horses of Franche-Comté are said to have the legs of tigers, and the bellies of hinds; but they are short and thick, and of the middle size, being much better adapted for draught than for riding. The horses of Gascony are not unlike those of Spain, but they are not so handsome and active. The best come from Limousin, where they bear a strong resemblance to the Barb, and, like them, are excellent for the chase. They are, however, slow in coming to perfection; should be carefully treated while young; and also should not be backed till they are eight years old. Normandy furnishes the next best, which, though not so good for the chase, are yet better for war. Besides these, there are the horses of Poitou, &c.—all differing from each other in some essential degree; for France, in its vast extent, has various breeds. Great exertions have been made in that country to cope with England in the production of horses. Napoleon I. used every means to procure some of our best blood-animals, and he imported largely from Arabia. But all efforts have hitherto proved unavailing, notwithstanding the French nobility have gone so far as to procure English grooms and jockeys to manage their horses. The beauty, strength, and fleetness of the English horse still bears the bell from all other countries. At Waterloo, the charge of our life-guards proved irresistible; much of which irresistibility must be attributed to the horses they rode, as the French horses are very inferior.

France is said to contain no fewer than 2,500,000 horses; which, of course, includes every description of the species. Of mares there are about 1,300,000, the greater number of which are used for the breeding of mules. Independent of these, somewhere about 40,000 horses are annually imported into this country, either with a view to the improvement of the native breeds, or for the purposes of sale. In reference to the horse employed on the road, Mr. Hoüel, in a work on the varieties of the horse in France, says—"I have not elsewhere seen such horses at the collar, under the diligence or the post-carriage, or in the farm-cart. They are enduring and energetic beyond description. At the voice of the brutal driver, or at the dreaded sound of his never-ceasing whip, they put forth all their strength, and keep their condition when other horses would die of neglect and hard treatment."

The editor of *The Horse* says—"Every country that has occupied itself with the amelioration of its breed of horses, has deemed it necessary to have a public register of the names and progeny of those of an acknowledged race. England has had its stud-book nearly half a century, containing a list of all the horses of pure blood that have existed in the country. France, in the year 1837, had her first stud-book, in which are inscribed the names of two hundred and fifteen stallions of pure English blood imported into France, or born there; two hundred and sixty-six Arabs, Barbs, Persian, or Turkish horses; two hundred and seventy-four English mares of true blood, and forty-one Eastern mares. This progeny was also traced so far as it was practicable." A work of this kind must necessarily form an epoch in the equestrian annals of any country where it is kept or produced.

THE GERMAN HORSE.

The German horses were originally from Arabian and Barbary stocks; nevertheless they appear to be small and ill-shaped; it is said, also, that they are weak and washy, with tender hoofs. There are, however, some exceptions, as there are some studs, in which particular attention has been paid, as well to their breed as to their management. The Hungarian horses are excellent for the draught as well as the saddle. Formerly gipsies were the principal horse-dealers in Hungary; but now there are several noble studs scattered over the country, the trade has, in a great measure, passed out of their hands. The Hussars, who use them in war, usually slit their nostrils; which is done, as it is said, to prevent their neighing; but, perhaps, without any real foundation. The cream-coloured breed of horses, used for the state-carriages of the court of England, are of Hanoverian breed.

The imperial establishment for the breeding of horses at Mesohagye's, near Carlsburg, in Austria, is both an excellent and extensive one. It is decidedly the finest in the Austrian dominions for the breeding of horses. The Duke of Ragusa describes it as standing on forty thousand acres of land of the best quality, embracing an area of forty-five miles—surrounded, in its whole extent, by a steep and broad ditch, and a plantation sixty feet wide. Originally it was designed to recruit the cavalry; but now it is devoted to the object of obtaining stallions of a good breed, which are sent to different depôts, with a view to keep up the necessary supply for the various provinces. To produce these, one thousand brood mares and forty-eight stallions are kept; two hundred additional mares, and six hundred oxen, are maintained to cultivate the ground. "The plain," says the duke, "is divided into four equal parts, and each of these subdivided into portions, resembling so many farms. At the age of four years, the young horses are all collected in the centre of the establishment. A selection is first made of the best animals, to supply the deficiencies in the establishment, in order always to keep it on the same footing. A second selection is then made from the other horses: none of these, however, are sent away until they are five years old; but the horses that are not of sufficient value to be selected, are sold by auction, or sent to the army to keep up the cavalry, as circumstances may require.

"The imperial treasury advances to the establishment, every year, eighteen thousand florins, and is reimbursed by the sale of one hundred and fifty stallions, which are sent to the provinces every year, at the price of one thousand florins each; and by the value of the horses supplied to the cavalry. The value of a florin is about 2*s*. 1*d*. English money. All the other expenses incident to the maintenance and tear and wear of the establishment, are defrayed by what it, in itself, produces. This is, therefore, an immense estate—a farm on a colossal scale—with a stud in proportion, managed on account of the sovereign, and which produces a considerable revenue, independently of the principal object which is attained—the propagation and the multiplication of the best breeds of horses. He can always supply the wants of his army at a price almost incredibly small. For a horse of the light cavalry he pays only one hundred and ten florins; for the dragoons, one hundred and twenty; for the cuirassiers, one hundred and forty; for the train, one hundred and sixty; and for the artillery, one hundred and eighty. It is a great element of power to possess at home such an immense resource against a time of war, at an expense so far below that which the powers of the west and south of Europe are compelled to incur."

It is from the originally warlike character of the Germans that their country takes its name—Germany being derived from the Teutonic Ger-mann, a warring man.

In Prussia the government has established some extensive studs in different parts of the kingdom, and many noblemen of this country are in the possession of excellent establishments of their own. About the mouth of the Vistula there exists a large breed of horses well-adapted for agricultural purposes; but in the royal studs, attention has more especially been paid to the improvement of the cavalry horse, which now takes very high rank.

THE ITALIAN HORSE.

Of this animal little need now be said. Like everything else in this naturally fine country, the horse "has fallen from his high estate," and is now all but worthless. The races, as they were wont to be run in the days of Mrs. Piozzi, are thus described by the pen of that lively lady:—"The street is covered with sawdust, and made fast at both ends. Near the starting-post are elegant booths, lined with red velvet, for the court and first nobility. At the other end a piece of tapestry is hung, to prevent the creatures from dashing their brains out when they reach the goal. Thousands and tens of thousands of people, on foot, fill the course, so that it is a great wonder, to me, still that numbers are not killed. The prizes are exhibited to view in quite the old classical style—a piece of crimson damask for the winner; a small silver basin and ewer for the second; and so on, leaving no performer unrewarded.

"At last come out the horses without

riders, but with a narrow leathern strap hung across their bodies, which has a lump of ivory fixed to the end of it, all set full of sharp spikes like a hedgehog; and this goads them along while galloping, worse than any spur could do; because the faster they run, the more this odd machine keeps jumping up and down, and pricking their sides ridiculously enough; and it makes one laugh to see that some of them are so tickled by it, as not to run at all, but set about plunging in order to rid themselves of the inconvenience, instead of driving forward to divert the mob, who leap and caper, and shout with delight, and lash the laggers along with great indignation indeed, and with the most comical gestures."

Races of a similar kind take place at Rome.

THE SPANISH HORSE.

Spain was early celebrated for a breed of fine horses, which took its rise in the Moorish Barb, when that peninsula was subject to the Moors. When Rome was at its highest splendour, the horses of Calpe—the modern Gibraltar—were in high repute. This part of Spain being situated at the south-western extremity of the Peninsula, opposite the Barbary coast, horses were readily imported from north-western Africa; and hence the origin of the genettes. The Spanish horses are well made and handsome, as well as very active and nimble; they have fine eyes, handsome legs and heads, and are docile, and easily managed.

For many centuries they took rank after the Arabian and Barb; but they could not be considered as being other than Barbs themselves, having been only transplanted to European soil, where, although they might have become slightly altered in appearance by the change, they suffered no material injury. "I have seen many Spanish horses," says Solleysel, "and they are all extremely beautiful. They are the most proper of all to be drawn by a curious pencil, or to be mounted by a king, when he unbends to show himself in his majestic glory to the people."

The common breeds of the Spanish horses, however, are not to be confounded with the warrior sorts—they having nothing extraordinary in them. It is in Andalusia, Estremadura, and Granada, that the highest races are to be found. Berenger, who was an excellent judge, thus describes them:—"The neck is long and arched, perhaps somewhat thick, but clothed with a full and flowing mane; the head may be a little too coarse; the ears long, but well-placed; the eyes large, bold, and full of fire; their carriage lofty, proud, and noble; the breast large; the shoulders sometimes thick; the belly frequently too full and swelling; and the loins a little too low; but the ribs round, and the croup round and full; with the legs well formed, and clear of hair; and the sinews at a distance from the bone; active and ready in their paces; of quick apprehension; a memory singularly faithful; obedient to the utmost proof; docile and affectionate to man, yet full of spirit and courage."

The food of the modern Spanish horse consists principally of chopped straw, with a little barley. During the Peninsular war, when the French and English cavalry horses were placed on this fare in Spain, they at first became very much weakened, and many of them died; but, when they grew a little accustomed to it, they regained their strength, and, consequently, their spirit and courage.

THE PORTUGUESE HORSE.

The Lusitanian or Portuguese horse was, at one time, so highly celebrated for its speed, that the Roman historian, Justin, compares it to the velocity of the wind. Berenger, however, who lived before the glory of the Spanish horse had entirely faded away, says that "the Portugal horses are in no repute, and differ as much from their neighbours, the Spaniards, as crabs from apples, as aloes from grapes." After the annexation of Portugal to Spain, the latter country was preferred for establishing studs; and the former directed its attention rather to the rearing of cattle for the shambles and the plough, and mules and asses for draught. Here, then, the horse became rather the associate of pomp and pleasure; and such as were wanted, were mostly imported from Spain. The horse is now, however, receiving greater attention than, for a long period, has been devoted to it.

THE IRISH HORSE.

In some of the rich grazing counties of Ireland, such as Meath and Roscommon, a large long blood-horse is reared, of considerable

value; but he seldom has the elegance of the English animal. He is larger headed, more leggy, ragged-hipped, angular, yet with great power in the quarters, much depth beneath the knee, stout and hardy, full of fire and courage, and among the best leapers in the world. He is not generally, however, so tall as the English horse, being stunted in his growth; for the poverty and custom of the country impose upon him much hard work, at a time when he is unfit for labour of any kind. For this reason, too, the Irish horse is deficient in speed. There is, however, another explanation of this; and that is, that the thorough-bred Irish horse is not equal to the thorough-bred English. Comparatively speaking, he is a weedy, leggy, worthless animal, and very little of him enters into the composition of the hunter or the hackney.

For leaping, the Irish horse has long been considered unrivalled. It is not, however, the leaping of the English horse, striding, as it were, over a low fence, and stretched at his full length over a higher one. It is rather the proper jump of the deer—beautiful to look at, and, both in height and extent, unequalled by the English horse. Much of this difference of leaping in the two countries, no doubt, depends on the training, and on the nature of the fences in Ireland, where there are so many inclosures with stone walls.

There are very few horses in the agricultural districts of Ireland, exclusively devoted to draught. The minute division of the farms renders it impossible for them to be kept. The occupier even of a tolerably sized Irish farm, wants a horse that shall carry him to market, and draw his small car, and perform every kind of drudgery—in short, a horse of all work; therefore the thorough draught-horse, whether Leicestershire or Suffolk, is rarely found in Ireland.

If we look to the general commerce of Ireland, there are few stage-waggons, or drays with immense cattle belonging to them. In the north, some stout horses are employed in the carriage of linen; but the majority of the *garrons* used in agriculture or commercial pursuits, are miserable and half-starved animals.

There is a native breed in Ulster, hardy, and sure-footed, but with little pretension to either beauty or speed.

THE HORSE IN HIS NATIVE STATE.

We have purposely reserved, till now, our description of the horse in his native state, as seen in the boundless Llanos, or savannas and prairies of South and North America, where he is entirely free, and where he is seen to the greatest advantage amidst his native pastures. To form anything like a correct idea of this noble animal in his native simplicity, we must not look for him in the pastures or the stables to which he has been consigned by man; but in those wild and extensive plains where he has been originally produced, whether in the Old or the New World, and where he ranges at will and riot in the unrestrained license of a rich, a varied, and a luxuriant vegetation. In this state of happy independence he disdains the assistance of man, which only tends to servitude. In the interminable Llano, or prairie, where he wanders at liberty, he seems no way incommoded by the inconveniences to which he is subjected in Europe. The verdure of the broad expanse of grass supplies his wants; and the climate that never knows a winter, is, perhaps, more congenial to his constitution than any other, as he naturally seems to be fond of heat. His enemies of the forest are but few, for none but the larger kinds will venture to attack him: and any one of these he is, singly, mostly able to overcome; while, at the same time, he is content to find safety in society; for the wild horses of those countries always herd together. A gentleman describing what he himself had witnessed with a friend whilst travelling in South America, thus notices the horse in his native or wild state:—

"About half-past ten we discerned a creature in motion at an immense distance, and instantly started in pursuit. Fifteen minutes' riding brought us near enough to discern, by its fleetness, that it could not be a buffalo; yet it was too large for an antelope, or a deer. On we went, and soon distinguished the erect head, the flowing mane, and the beautiful proportions of the wild horse of the prairie. He saw us, and sped away with arrowy swiftness, till he gained a distant eminence, when he turned to gaze at us, and suffered us to approach within four hundred yards, and then bounded away again in another direction, with a graceful velocity delightful to behold. We paused, for

to pursue him with a view to capture, was out of the question. When he discovered we were not following him, he also paused, and now seemed to be inspired with curiosity equal to our own; for, after making a slight turn, he came nearer until we could distinguish the inquiring expression of his clear, bright eye, and the quiet curl of his inflated nostrils. We had no hope of catching, and did not wish to kill him, but our curiosity led us to approach him slowly. We had not advanced far before he moved away, and, circling round, approached on the other side. He was a beautiful animal—a sorrel, with jet black mane and tail. As he moved we could see the muscles quiver in his glossy limbs; and, when half playfully, and half in fright, he tossed his flowing mane in the air, and flourished his long silky tail, our admiration knew no bounds, and we longed—hopelessly, vexatiously longed—to possess him. We might have shot him where we stood; but had we been starving, we could scarcely have done it. He was free, and we loved him for the very possession of that liberty we longed to take from him; but we would not kill him. We fired a rifle over his head; he heard the shot, and the whiz of the ball, and away he went, disappearing in the next hollow—showing himself again as he crossed the distant ridges—still seeming smaller, until he faded away a speck on the far horizon's edge."

The wild horses which exist in the Llanos of South America, are descendants of those introduced by the Spaniards. In the province of Cumana, there are great numbers in the forest, wandering about in companies, generally to the number of five or six hundred. They occupy the great savannas, where it is difficult even to disturb, far less to catch them. In the dry season, they are sometimes obliged to go eight, ten, and even more miles in search of water; and when this is the case they set out in regular ranks, four abreast. Five or six scouts precede the troop by about fifty paces. If they perceive an enemy they neigh, and the troop stops; if they evade him, they continue their march; but if any one dares to march across their squadron, they turn on him and crush him under their feet. No foe is capable of withstanding their attack. They have a regular chief, who marches between the scouts and the squadron—a kind of adjutant, whose duty consists in hindering any individual from quitting the ranks. If any one attempts to straggle, either from hunger or fatigue, he is bitten till he resumes his place. When wild horses are feeding, should any stragglers be threatened with danger by an enemy, a particular signal, which they all understand, is given, when they close into a dense mass, and trample the assailant to death. When they themselves resolve upon making an attack, their leader shows the example; and if he considers a retreat necessary, he gives the signal, and it is instantly obeyed.

The wild horses of Tartary, although easily domesticated, materially differ in character from those on the plains of South America. They will not suffer a stranger to join them. If a domesticated horse come in their way, unprotected by his master, they attack him with their teeth and their heels, and speedily destroy him. They readily submit, however, to the dominion of man, and become perfectly docile and faithful.

Among the Tartars, the flesh of the horse is a frequent article of food; and although they do not, like the Indians of the Pampas, eat it raw, their mode of cookery would not be very inviting to the European epicure. They cut the muscular parts into slices, and place them under their saddles; and after they have galloped thirty or forty miles, the meat becomes tender and sodden, and fit for their table; and, at all their feasts, the first and last, and most favourite dish, is a horse's head.

When water was not at hand, the Scythians used to draw blood from their horses, and drink it; and the Dukes of Muscovy, for nearly two hundred and sixty years, presented Tartar ambassadors with the milk of mares. If any of this milk fell upon the mane of the horse, the Duke, by custom, was bound to lick it off.

Troops of wild horses are occasionally met with in the central parts of Africa, the deserts of Arabia, and in a few other parts of the world; but nowhere do they equal the domesticated horse in form, strength, or even speed.

The Quagga, in the Zoological Society's valuable collection in Regent's-park, London, belongs to the same family of animals as the horse (*equidæ*). This specimen is brown;

head, neck, and withers, or front of body, blackish streaked; lower part of body, legs, and tail, white. The hoofs are flattish beneath. It is a native of the Cape of Good Hope, where it lives on the open plains. The Quagga is said to derive its name from the sound of its voice. Thus we read in Pringle:—

"The timorous quagga's wild whistling neigh
Is heard by the brak fountain far away."

Methuen, in his *Life in the Wilderness*, informs us, that when the supply of antelope meat of his party was exhausted, they occasionally had recourse to a steak from the quagga, and found it very sweet and good, though it looked coarse, and was marbled with yellow fat. He advises travellers in the wilderness, who have an antipathy to anything like horse-flesh, to try to get rid of their dislike as fast as possible; and assures us that the Griquas, a nation who dwell in South Africa, prefer the meat of the quagga to almost any other; while his cook Apollos, who was with the British troops in their expedition to Natal, and was blockaded with them in the trenches by the Boors (when they were compelled to feed on horse-flesh), was particularly fond of quagga steaks, and regarded them as the most savoury food he could obtain.

THE WILD HORSE OF SOUTH AMERICA.

All travellers, who have crossed the plains extending from the shores of La Plata to Patagonia, have spoken of numerous herds of wild horses. Some affirm that they have seen ten thousand in one troop, all apparently under the command of a leader, the strongest and boldest of the herd, whom they implicitly obey. A secret instinct teaches them that their safety consists in their union, and in a principle of subordination. The lion, the tiger, and the leopard are their principal foes, which, as we have said, they trample to death, being led on by their leader, which is the first to face the danger. Should the prudence of their leader suggest the necessity of a retreat, the whole troop follow in his wake.

In the thinly inhabited parts of South America it is dangerous to fall-in with any of these troops, as when they see a horse mounted, they approach as near as they dare, and call upon the mounted horse with much eagerness. On such an occasion, if the rider be not on the alert, and have not considerable strength of arm, and sharpness of spur, his beast will divest himself of his burden, take to his heels, and be gone for ever.

Captain Head gives the following account of a meeting with a troop of wild horses, where the country is more thickly inhabited. Some poor captured animals are supposed to be forced along by their riders, at their very utmost speed:—"As they are thus galloping along, urged by the spur, it is interesting to see the groups of wild horses one passes. The mares, which are never ridden in South America, seem not to understand what makes the poor horse carry his head so low, and look so weary. The little innocent colts come running to meet him, and then start away frightened; while old horses, whose white marks, on the flanks and backs, betray their acquaintance with the spur and saddle, walk slowly away for some distance; then, breaking into a trot as they seek their safety, snort and look behind them, first with one eye, and then with the other, turning their nose from right to left, and carrying their long tail high in the air."

The same pleasing writer describes the system of horse-management among the rude inhabitants of the plains of South America. They have no stables, no fenced pastures. One horse is usually kept tied at the door of the hut, fed scantily at night on maize; or, at other times, several may be enclosed in the *corral*, which is a circular space surrounded by rough posts driven firmly into the ground. The mares are never ridden or attempted to be tamed, but wander, with their foals, wherever they please.

When the *Gaucho*, the native inhabitant of the plains, wants horses for himself or for the supply of the traveller, he either goes with his lasso to the corral, and selects those, possibly, who, on the preceding day, had for the first time been backed, or he scampers across the plain, and presently returns with an unwilling, struggling, or subdued captive. When the services of the animals have been exacted, he either takes them to the corral, and feeds them with a small quantity of maize, if he thinks he shall presently need them again, or he, once more, turns them loose on the plains.

Travellers give some amusing accounts of the manner in which all this is effected. Miers thus describes the lasso, simple in its construction, but all-powerful in the hands of the Gaucho.

"The lasso is a missile weapon used by every native of the United Provinces and Chili. It is a very strong plaited thong of equal thickness, half an inch in diameter, and forty feet long, made of many strips of green hide, plaited like a whipthong, and rendered supple by grease. It has, at one end, an iron ring above an inch and a-half in diameter, through which the thong is passed, and this forms a running noose. The Gaucho, or native Peon, is generally mounted on horseback when he uses the lasso. One end of the thong is affixed to his saddle girth: the remainder he coils carefully in his left hand, leaving about twelve feet belonging to the noose-end, in a coil, and a half of which he holds in his right hand. He then swings this long noose horizontally round his head, the weight of the iron ring, at the end of the noose, assisting in giving to it, by a continued circular motion, a sufficient force to project it the whole length of the line."

When the Gauchos wish to have a grand breaking-in, they drive a whole herd of wild horses into the corral. "The corral was quite full of horses, most of which were young ones about two or three years old. The capitar (chief Gaucho), mounted on a strong steady horse, rode into the corral, and threw his lasso over the neck of a young horse, and dragged him to the gate. For some time the colt was very unwilling to leave his comrades; but the moment he was forced out of the corral, his first idea was to gallop away: however, a timely jerk of the lasso checked him in the most effectual way. The peons now ran after him on foot, and threw a lasso over his fore-legs, just above the fetlock; and twitching it, they pulled his legs from under him so suddenly, that I really thought the fall he got had killed him. In an instant a Gaucho was seated on his head, and, with his long knife, and in a few seconds, cut off the whole of the horse's mane, while another cut the hair from the end of his tail. This, they told me, was a mark that the horse had been once mounted. They then put a piece of hide into his mouth, to serve for a bit, and a strong hide halter on his head. The Gaucho who was to mount, arranged his spurs, which were unusually long and sharp; and, while two men held the horse by his ears, he put on the saddle, which he girthed extremely tight. He then caught hold of the horse's ear, and, in an instant, vaulted into the saddle; upon which the man who held the animal by the halter, threw the end to the rider, and, from that moment, no one seemed to take any further notice of him.

"The horse, instantly, began to jump in a manner which made it very difficult for the rider to keep his seat, and quite different from the kick or plunge of an English horse: however, the Gaucho's spurs soon set him going, and off he galloped, doing everything in his power to throw his rider.

"Another horse was immediately brought from the corral; and so quick was the operation, that twelve Gauchos were mounted in a space which, I think, hardly exceeded an hour. It was wonderful to see the different manner in which different horses behaved. Some would actually scream while the Gauchos were girding the saddle upon their backs; some would instantly lie down and roll upon it; while some would stand without being held—their legs stiff, and in unnatural positions; their necks half bent towards their tails, and looking vicious and obstinate; and I could not help thinking that I would not have mounted one of those for any reward that could be offered me, for they were invariably the most difficult to subdue.

"It was now curious to look around and see the Gauchos on the horizon, in different directions, trying to bring their horses back to the corral, which is the most difficult part of their work; for the poor creatures had been so scared there, that they were unwilling to return to the place. It was amusing to see the antics of the horses—they were jumping and dancing in different ways, while the right arm of the Gauchos was seen flogging them. At last they brought the horses back, apparently subdued, and broken in. The saddles and bridles were taken off, and the young horses trotted off towards the corral, neighing to one another."

The manufacture of the Gaucho's boots is somewhat singular. "They are formed of the ham and part of the leg-skin of a colt taken

reeking from the mother, which is said to be sacrificed for the sole purpose, just at the time of bearing when the hair has not begun to grow. At this stage the skin strips off easily, and is very white and beautiful in texture and appearance. The ham forms the calf of the boot; the hock easily adapts itself to the heel; and the leg above the fetlock constitutes the foot; the whole making a neat and elegant half-boot, with an aperture sufficient for the great toe to project through."

When the Gaucho wishes to take a wild horse, he mounts one that has been used to the sport, and gallops over the plain. As soon as he comes sufficiently near his prey, "the lasso is thrown round the two hind-legs; and as the Gaucho rides a little on one side, the jerk pulls the entangled horse's feet laterally, so as to throw him on his side, without endangering his knees or his face. Before the horse can recover the shock, the rider dismounts, and snatching his poncho or cloak from his shoulders, wraps it round the prostrate animal's head. He then forces into his mouth one of the powerful bridles of the country, straps a saddle on his back, and bestriding him, removes the poncho; upon which the astonished horse springs on his legs, and endeavours, by a thousand vain efforts, to disencumber himself of his new master, who sits quite composedly on his back, and, by a discipline which never fails, reduces the animal to such complete obedience, that he is soon trained to lend his whole speed and strength to the capture of his companions."

These animals possess much of the form of the Spanish horse, from which they sprung. They are tamed, as has been seen, with far less difficulty than could be thought possible; and, although theirs is the obedience of fear, and enforced at first by the whip and spur, there are no horses that so soon and so perfectly exert their sagacity and their power in the service of man. They are possessed of no extraordinary speed; but they are capable of enduring immense fatigue, and are frequently ridden fifty or sixty miles without drawing bit. Indeed, it is known that they have been urged on by the cruel spur of the Gaucho, more than a hundred miles, and at the rate of twelve miles in the hour.

Like the Arab horses, they know no intermediate pace between the walk and the gallop. Although, at the end of a day so hard, their sides are horribly mangled, and they themselves so completely exhausted, there is this consolation for them—that they are immediately turned loose on the plains, and it will be their own fault if they are speedily caught again. The mare is occasionally killed for food, and, especially, on occasions of unusual festivity. General San Martin, during the war for independence, gave a feast to the Indian allies attached to his army; and the flesh of mares, with the blood mixed with gin, formed the whole of the entertainment.

On such dry and sultry plains the supply of water is often scanty. When this is the case, a species of madness seizes on the horses, and their generous and docile qualities are no longer recognised. They rush violently into every pond and lake, savagely mangling and trampling upon one another; and the carcasses of many thousands of them, destroyed by their fellows, have occasionally been seen in and around a considerable pool. This is one of the means by which the too rapid increase of this quadruped is, by an ordinance of Nature, prevented. It is observed by Humboldt, that during the periodical risings of the large rivers, vast numbers of wild horses are drowned. This is especially the case when the Apure is swollen, and when these animals attempt to reach the rising grounds of the Llanos.

The bolas is another instrument which is occasionally brought into requisition by the Gauchos for the catching of wild horses. It consists of two balls, of two kinds, attached to thongs. The first is composed of three round stones, about the size of a man's fist, covered with strong leather, and attached to a common centre by tough leathern cords, three feet long. The smallest of the three is taken in the hand; and, after whirling the others violently round the head, the whole are thrown to the distance of about one hundred feet, when they so maim and entwine themselves round the limbs of any living creature, that it is impossible to escape from them. The other kind is a single ball of the same size, except when it is made of iron or copper, it being then smaller. It is also covered with leather, and has a leathern thong attached, by which it is whirled round, and, at the hard gallop,

projected with immense force to the distance of five hundred feet. The launching of this weapon amidst a tribe of wild horses, is thus described by Robertson, in his *History of Paraguay*:—

"The herd consisted of about two thousand horses, neighing and snorting, with ears erect and flowing tails, their manes outspread to the wind—affrighted the moment they were conscious of pursuit. The Gauchos set up their usual cry; the dogs were left in the distance; and it was not till we had followed the flock at full speed, and without a check, for five miles, that the two headmost peons launched their bolas at the horse which each had respectively singled out of the herd. Down to the ground, with frightful somersaults, came two gallant colts. The herd continued its headlong flight, leaving behind their two prostrate companions. Upon these the whole band of Gauchos now ran in; lassos were applied to tie their legs; one man held down the head of each horse, and another the hind quarters; while with singular dexterity, two other Gauchos put the saddles and bridles on their fallen, trembling, and nearly frantic victims. This done, the two men who had brought down the colts, bestrode them as they still lay on the ground. In a moment the lassos which bound their legs were loosened, and, at the same time, a shout from the field so frightened the colts, that up they started on all fours, but, to their astonishment, each with a rider on his back, riveted, as it were, to the saddle, and controlling them by means of a never-before-dreamed-of bit in his mouth. The animals made a simultaneous and most surprising vault; they reared, plunged, and kicked; now they started off at full gallop, and anon stopped short in their career, with their heads between their legs, endeavouring to throw their riders. Immovable sat the two Indians; they smiled at the unavailing efforts of the turbulent and outrageous animals to unseat them; and, in less than an hour from the time of their mounting, it was very evident who were to be the masters. The horses did their very most; the Indians never lost either the security or the grace of their seats; till, after two hours of the most violent efforts to rid themselves of their burden, the horses were so exhausted, that, drenched in sweat, with gored and palpitating sides, and hanging down their heads, they stood for five minutes together, panting and confounded; but they made not a single effort to move. Then came the Gaucho's turn to exercise his more positive authority. Hitherto he had been entirely upon the defensive. His object was simply to keep his seat, and tire out his horse. He now wanted to move it in a given direction: wayward, zigzag, often interrupted was his course at first; still the Gauchos made for a given point, and they advanced towards it; till, at the end of about three hours, the now mastered animals moved in nearly a direct line."

In 1537, horses were first landed at Buenos Ayres, in South America; and between forty and fifty years afterwards, they were found wild at the Straits of Magellan. From that time to this, they have continued to multiply and extend the range of their existence. North, south; east, and west, the horse abounds in the American hemisphere. At Terra-del-Fuega, almost every man, woman, and child, have their horses; even the Indians have them: and, it is not a little remarkable, that the countless troops that now skirr the Llanos of the South, and the prairies of the North, should all have sprung from the Iberian stock first taken into Mexico by Cortes, and into Peru by Pizarro.

We have already alluded to the fact of the horse having been, at some remote period, a denizen of the American continent. Professor Owen thinks that they existed there even before the creation of man. In his work on *British Fossil Mammals*, he says—"The species of equus which existed during the Miocine periods of geology, in both North and South America, appears to have been blotted out of the Fauna of those continents before the existence of man. The aborigines, whom the Spanish conquistadores found in possession of Peru and Mexico, had no tradition or hieroglyphic indicative of such a quadruped; and the horses, the invaders imported from Europe, were viewed with astonishment and alarm. The researches of Mr. Darwin and Mr. Lund, have indisputably proved that the genus *equus* was represented during the Pliocine period, by a species *(equus curvideus)* which is shown to be distinct from the European fossils, and also from the existing species. Fossil remains of the horse have been found also in North

America. The geographical range of the genus *equus* was, therefore, more extensive at the Pliocine period, than that of the rhinoceros, of which both the fossil and the existing species are confined to the Old World of the geographers. The horse, in its ancient distribution over both hemispheres of the globe, resembles the mastadon, and appears to have become extinct in North America at the same time with the mastadon giganteus, and in South America, with the mastadon of the Andes, and the megatherium. Well may Mr. Darwin say—'It is a marvellous event in the history of animals, that a native kind should have disappeared, to be succeeded, in after ages, by the countless herds introduced with the Spanish conquerors.'"

THE NORTH AMERICAN HORSE.

Traversing the isthmus of Darien, and entering North America, we find herds of wild horses, the offspring of those which formerly escaped from the Spanish possessions in Mexico—even abounding on the extensive prairies that lie to the west of the Mississippi. They were once numerous on the Kootannie Lands, near the northern sources of the Columbia. The young stallions live in separate herds, being driven away by the old ones, and are easily ensnared by using domestic mares as a decoy. The natives are acquainted with the Spanish-American method of taking them with the lasso. Major Long mentions that "horses are an object of a particular hunt to the Osages. For the purpose of obtaining these animals—which, in their wild state, preserve all their fleetness—they go in a large party to the country of the Red Canadian river, where they are to be found in considerable numbers. When they discover a troop, they distribute themselves into three parties, two of which take their stations at different and proper distances on the route, which, by previous experience, they know the horses will most probably take when endeavouring to escape. This arrangement being completed, the first party commences the pursuit in the direction of their colleagues, at whose position they at length arrive. The second party then continues the chase with fresh horses, and pursues the fugitives to the third party, which generally succeeds in so far running them down, as to noose and capture a considerable number of them."

The domestic horse is an object of great value to the nomadic tribes of Indians that frequent the extensive plains of the Missouri, &c.; for they are not only useful in transporting their tents and families from place to place, but one of the highest objects of the ambition of a young Indian, is to possess a good horse for the chase of the buffalo—an exercise of which he is passionately fond. To steal the horse of an adverse tribe is considered to be nearly as heroic an exploit as killing an enemy on the field of battle; and the distance to which they occasionally travel, and the privations they undergo in their horse-marauding excursions, are almost incredible. An Indian who owns a horse, scarcely ever ventures to sleep after night-fall; but sits at the door of his tent, with the halter in one hand, and his gun in the other; the animal's fore-legs being, at the same time, tied together with thongs of leather. Notwithstanding all this care, however, it happens very often that the hunter, suffering himself to be overpowered by sleep for a few moments, awakes from the noise made by the thief galloping off with his animal.

In Great Britain, opportunities by which the swimming powers of the horse might be tested, rarely occur. Mr. Darwin says, that when he was in South America, "I crossed the Lucia near its mouth, and was surprised to observe how easily our horses, although not used to swim, passed over a width of, at least, six hundred yards. On mentioning this at Monte Video, I was told that a vessel containing some mountebanks and their horses, being wrecked in the Plata, one horse swam seven miles to the shore. In the course of the day, I was amused by the dexterity with which a Gaucho forced native horses to swim a river. He stripped off his clothes, and jumping on the back of the animal, rode into the water till it was out of its depth; then slipping off over the crupper, he caught hold of the tail; and as often as the horse turned, the man frightened it back by splashing water in its face. As soon as the horse touched the bottom on the other side, the man pulled himself on, and was firmly seated, bridle in hand, before the horse gained the bank. A naked man on a naked horse is a fine spectacle. I had no idea how well the

two animals suited each other. The tail is a very useful appendage. I have passed a river in a boat, with four people in it, which was ferried across in the same way as the Gaucho. If a man and horse have to cross a broad river, the best plan is for the man to catch hold of the pommel or mane, and help himself with the other arm."

In Pennsylvania, a horse called the Conestoga, long in the legs, and light in the carcass, is found. Its height is about seventeen hands, and it is used principally as a carriage-horse. This animal is pretty general in the middle states. In Kentucky and Virginia, the English horse, with a fair quantity of blood, is found. Also in the Southern states, where purity has had greater attention. Shark, the best English horse of his day, was the sire of the best stock in Virginia; and Tally-ho gave his offspring to the Jerseys.

THE CANADIAN HORSE.

Winter travelling in Canada is sometimes very expeditious; and it is surprising with what speed a good Canadian horse will go, when drawing a cabriolet over the ice. Instances have occurred of their travelling ninety miles, in one of these vehicles, in twelve hours; but, when this happens, the roads must be very smooth and hard.

The Canadian horse is a remarkably hardy animal; his best pace is a trot; and although he is accustomed to much bad usage and hard work, he is the most willing creature in the world—as the jockeys term it—for he never refuses the draught. In the coldest weather horses come into Quebec from the country, and are left standing in the open air, without any covering, for hours together, while their owners are transacting their business, or drinking; yet they seem not to be any the worse for it. In the winter, like all other quadrupeds of that country, they acquire an increased quantity of fur to protect them from the cold; and the curry-comb is never used. When they have been heated by fast driving on a cold day, they appear to have a sort of icicle at every hair; and icicles, two or three inches in length, often hang at their noses.

In the winter season, travelling on the ice is at all times dangerous; and it is very common for sleigh, horses, and men, to fall through the ice where the water is some hundred feet deep: luckily, however, the weak places are of no great extent, and the traveller extricates himself from the sleigh as quickly as possible, when he lays hold of the ice, which is generally strong enough to support him, though it will not bear the weight of the horses. The pulling of these out is done in a manner perfectly unique, the horses being often nearly strangled to save them from suffocation.

When the horses fall through—for there are generally two in these sleighs—their struggles only tend to injure and sink each other; but as they have always round their necks a rope with a running noose, the moment the ice breaks, the driver and passengers jump out, and catching hold of the rope, pull it with all their force. This, in a very few minutes, stops the breath of the horses; and no sooner does this happen, than they rise in the water, float on one side, and are drawn out on strong ice, when the noose of the rope being loosened, respiration returns. In a short time, the horses are on their feet, and as much alive as ever. This operation has been known to be performed two or three times a-day on the same horses. The Canadians state, that horses which are often on the lakes, become so accustomed to being hanged, that they think nothing at all of it. But, though the case is very common, the attempt does not always succeed; for it sometimes happens that both sleigh and horses go to the bottom, if not extricated in time.

Another remarkable fact respecting the Canadian horses, is said to be a great fondness for fish. To what extent they carry this singular appetite we have never heard described. The kind of fish is said to be a species of cod; and the manner of catching them is by cutting holes in the ice, and putting down either nets or lines. Over this hole a temporary house is built, large enough to contain half-a-dozen fishermen, and a stove to keep them warm. Such as cannot afford deals to build a house, substitute large pieces of ice, with which they form a kind of defence against the weather, and literally pursue their piscatory sport in an ice-house.

A correspondent of the *Penny Magazine*, sent to that periodical the following instance of sagacity in the North American horse:—"A short distance below Fort Erie, and about

a mile from where the river Niagara escapes over a barrier of rock from the depths of Lake Erie, a ferry has long been established across that broad, and there exceedingly rapid, river; the distance from shore to shore being a little over one-third of a mile. On the Canada side of the river is the small village of Waterloo; and opposite thereto, on the United States' side, is the large river of Black Rock, distant from the young and flourishing city of Buffalo two miles. In completing the Erie canal, a pier or dam was erected—up and down the river, and opposite to Black Rock, at no great distance from the shore, for the purpose of raising the waters of the Niagara to such a height that they might be made to supply an adjoining section of the Erie canal. This pier was a great obstruction to the ferry-boats; for, previous to its erection, passengers embarked from *terra firma* on one side of the river, and were landed, without any difficulty, on the other; but, after this dam was constructed, it became necessary to employ two sets of boats —one to navigate the river, and the other the basin; so that all passengers, as well as goods or luggage, had to be landed on this narrow wall, and reshipped. Shortly after the erection of the pier-dam, a boat, propelled by horses, was established between this pier and the Canada shore. The horses moved upon a circular platform, which, consequently, was put in motion; to which other machinery was connected, that acted upon paddle-wheels attached to the sides of the boat. The boat belonged to persons connected with the ferry on the American side of the river; but, owing to the barrier formed by the pier, the horses employed on the boat were stabled at night in the village of Waterloo. The two horses—for that boat had but two—worked admirably, considering the very few lessons they had had previous to their introduction upon the main river. One of the horses employed on the new ferry-boat, had once been a dapple-grey; but, at the period I am speaking of, he had become white. He was still hale and hearty, for he had a kind and indulgent master.

"The first evening after the horses had been a short time in the stable to which they were strangers, they were brought out for the purpose of being watered at the river—the common custom of this place. The attendant was mounted on the bay horse; the white one was known to be so gentle and docile that he was allowed to drink where he pleased. I happened to be standing close by, in company with my friend W——, the ferry contractor of the Canada side, and thus had an opportunity of witnessing the whole proceedings of "Old Grizzle," the name that the white horse still went by. The moment he got round the corner of the building, so as to have a view of his home on the opposite side, he stopped and gazed intently. He then advanced to the brink of the river, when he again stopped, and looked earnestly across for a short time; then waded into the water until it had reached his chest—drank a little, lifted his head, and, with his lips closed, and his eyes fixed upon some object upon the furthest shore, remained for a short time perfectly motionless. Apparently having made up his mind to the task, he then waded further into the river until the water reached his ribs, when off he shot into the deep water without hesitation. The current being so strong and rapid—the river boiling and turmoiling over a rocky bed, at the rate of six miles an hour—it was impossible for the courageous and attached animal to keep a direct course across, although he breasted the waves heroically, and swam with remarkable vigour. Had he been able to steer his way directly across, the pier-wall would have proved an insurmountable barrier. As it was, the strength of the current forced him down to below where the lower extremity of this long pier abuts upon an island, the shore of which being low and shelving, he was enabled to effect a landing with comparative ease. Having regained *terra firma*, he shook the water from his dripping flanks; but he did not halt over a few minutes, when he plunged into the basin, and soon regained his native shore. The distance from where Grizzle took the water, to where he effected a landing on the island, was about seven hundred yards; but the efforts made to swim directly across against the powerful current, must have rendered the undertaking a much more laborious one. At the commencement of his voyage, his arched neck and withers were above the surface; but before he gained the island, his head only was visible. He reached his own-stable door—that home for which he had risked so much—

Painted by J. H. Laporte.

Engraved by E. Hacker

MARE AND FOAL.

to the no small astonishment of his owner. This unexpected visit evidently made a favourable impression upon his master, for he was heard to vow, that if old Grizzle performed the same feat a second time, for the future he should remain on his own side of the river, and never be sent to the mill again. Grizzle was sent back to work the boat on the following day; but he embraced the very first opportunity that occurred of escaping, swam back in the way he had done before; and his owner not being a person to break the promise he had once made, never afterwards dispossessed him of the stable he had long been accustomed to, and treated him with marked kindness and attention."

THE BRITISH HORSE.

Having detailed, with as much fulness as we deem necessary, the principal features and characteristics of the horses of those nations which have, more or less, held his qualities in high estimation, we now proceed to give a concise history of the English animal, and to trace the improvement of the indigenous breed of this country to its present exalted state. We may felicitate ourselves upon the fact, that the efforts of our breeders and trainers to improve the horse, have been crowned with the most decided success; for our animals are vastly superior even to the parent stock, to which we were first indebted for that new infusion of blood which has given them greater size, strength, and speed than are found in the horses of any other country.

The early history of the English horse is involved in too much uncertainty to allow us to speak with decision upon even the probabilities of his nature. It is said, however, that he was comparatively small in size, and of a wild and uncultivated form. When the island was invaded by Cæsar, he found the British horses regularly harnessed to war-chariots; but it is supposed probable, that after the people had advanced from barbarism into a tolerable degree of civilisation, the use of the animal was principally diverted to domestic purposes. This supposition rises out of the consideration of our insular position, which naturally made the ocean the element upon which we were best able to cope with our foes, and superseded the necessity of establishing an armed cavalry, until contention broke out among ourselves. By the Romans, however, the character of the horse of this country must have been changed. In their cavalry were horses from Italy, Gaul, and Spain; and these crossing with the indigenous breed of Britain, would produce another race different from that which had hitherto occupied the island. In the seventh century, it is on record, that the English then made use of the saddle, and that bishops and others rode on horseback. Before this period these dignitaries of the church pursued their journeys mostly on foot, and only made use of a horse when the circumstances were of such a character as to demand it. To mark their humility, they rode mares only—the female animal being, at that time, deemed neither so handsome nor so valuable as the male.

At a subsequent period, during the Saxon sway, it would appear that an excellent breed had risen up; and that in the time of Alfred, a master of the horse was appointed to look after the breeding and the training of that animal. This is an important fact, inasmuch as it forcibly indicates the height to which the horse had now attained in the royal estimation. This officer, in every subsequent reign, was attached to the sovereign, more particularly on state occasions.

On the death of Alfred, Athelstan succeeded to the throne, and this prince received from Hugh Capet, of France, a present of several German running-horses. This, then, was the cause of another cross in the English breed; and, as the horses presented were likely to be of the very best kind, we may conclude that they had an improving influence. The animal had now attained a high reputation; for we find that Athelstan, A.D. 930, forbade the exportation of horses, except as presents to monarchs. He also laboured to improve the breed, which had already began to be considered valuable on the continent.

About a century and a quarter later, William the Conqueror invaded England, and the success of his expedition soon produced a corresponding effect upon the breed of English horses. In his army were several Spanish animals, ridden by Norman knights; and the war-horse upon which he himself rode, was a native of Spain. The cross which took place

with these tended greatly to raise the fallen character of the English horse for activity, spirit, strength, and beauty. After the Conquest came the Crusades, which brought the English into an acquaintance with the fine horses of Syria and Arabia, and enabled many of our barons to possess themselves of some of these species. Richard Cœur-de-Lion himself purchased two of the breed at Cyprus, celebrated for their speed and beauty. We are not aware whether these ever found their way to Britain; but about fifty years later, in the reign of Henry II., we have the first mention of an Arabian horse having been introduced to this country. In order to carry the knight of the Middle Ages, invested in all the pomp and panoply of war, a strong animal was necessary. Accordingly, spirit, as well as power to carry his rider, must have been amongst the principal qualities requisite to be obtained in the war-horse;

THE ENGLISH WAR-HORSE.

and these would naturally force themselves upon men as the first objects of cultivation.

At this period the head of the war-horse was adorned with a crest, which, with his flanks and chest, were either wholly or partially protected by a mail covering. Indeed, the body of the animal was, in some instances, completely clothed in steel, and his bridle decorated with every adjunct of splendour that the purse of his rider could afford. Bells not unfrequently formed a part of his equipment; than which, in the language of an old troubadour, "there was nothing so proper to inspire confidence in a knight, and terror in an enemy."

At the early part of the twelfth century, Smoothfield, or Smithfield, begins to be spoken of as a horse-market, a tournament field, and a race-course. Here horses of every description were to be seen, from the mighty and majestic charger, down to the light and sleek, ambling palfrey. Smithfield, however, has long since passed from the character of both a field and a race-course. It is no longer what it was; and whatever may be the glories of its reminiscences in the mind of the metropolitan antiquary, it will soon cease to be remembered as having been the busy locality even of a cattle-market.

Passing over the reigns of future monarchs, many of whom laboured to improve the breeds, we come to the days of James I., who was a great lover of field sports, and also a great encourager, if not absolutely the establisher of horse-racing in Scotland. When he came to the English throne, he brought, from his own country, the same passion for sports; and as he was partial to racing, he determined to try the Arab breed in this exercise. Accordingly, he bought an Arabian, for which he gave five hundred pounds, but which was not very favourably estimated by the then Duke of Newcastle, who wrote a book on horsemanship, and pronounced the pet of James worthless. This judgment so materially damaged the Arabian in the eyes of English breeders, that the Arab lost caste immediately, and none of his kind regained proper position for nearly a century afterwards.

In the reigns of Elizabeth and James, a considerable number of writers appeared on the subject of the horse, and of farriery. Blunderville, the earliest now known, and one of the ablest, describes the generality of horses in the reign of Elizabeth, as either weak or sturdy jades, adapted only to draw; with, however, some very creditable exceptions indeed. As an example, he states the fact of one of them having travelled for a wager eighty miles within the day. The great breeders of the country had been accustomed to import, for the stud, "The Turk, the Barbarian, the Sardinian, the Neapolitan, the Jennet of Spain, the Hungarian, the high Almaine (German), the Friezland, the Flanders, and the Irish Hobby." Nevertheless, in those days, horses could not have been very numerous in England, since Queen Elizabeth experienced the utmost difficulty in mounting two or three thousand cavalry.

Throughout these early periods, as in modern times, riding on horseback, and trying the speed of horses, was peculiarly an English diversion. The country sports of hunting and hawking are of very ancient date; and our old chronicles furnish us with accounts of the constant diversions in Smithfield, then an extensive plain, where, as already observed, London citizens met, matched, and raced their horses; the superior social orders joining and taking part with the citizens.

The unfortunate Charles I. instituted races in Hyde-park; and, after him, Cromwell kept his stud; but racing did not, throughout the wars and the Protectorate, flourish as it had done in the days of James I. With the restoration of the merry monarch, racing, which had just lived a fitful season during the reign of the first Charles, was began again with spirit. At this period, with the exception of a few Arab stallions and mares, of a most uncertain lineage, introduced during the last reign, the description of horses to be met with in Great Britain, consisted of the Aboriginal race, the ponderous Norman war-horse, and the unwieldy Flanders mare, used by the nobility to drag their state-coaches, and to carry the pillions, upon which English dames were wont to jog behind their burly masters. It would be easy to trace all the variations of the horse, known in this country by the very significant names of "half-bred," from these three sources. Of course we look for them no further back than the first introduction of Arab and Persian blood; and we find them the produce of the stallions of those countries crossed with the English, Norman, and Flanders mares. Thus, from the first, descended the old English hunter, showing all the cross-made, hardy framework of his dam—the blood-like head, and flat sinewy legs of his sire. The roadster, from the same sire, was the produce of the second-class of our native mares. As distinct classes, probably no specimens of either are now to be found, their descendants constituting the endless ramifications of all the tag-rag nondescripts, by which the drudgery of town and country work is performed.

In the reign of Queen Anne the Arabian was brought again into fashion. A Mr. Darley was the means of this; and it is to the offspring of the animal—further noticed in our next chapter—which goes by this gentleman's name, that we are principally indebted for the breed of horses which we now possess, and which is unrivalled for strength, speed, and beauty.

The peculiar English system of breeding, essentially and usefully different from any other country in Europe, had an early commencement; but it was confined to the superior, chiefly to the sporting classes. This system has been gradually and progressively improved to the present time. Within the period of its existence we have produced specimens in every variety of the animal, bordering on attainable perfection. Such, however, it must be acknowledged, have been, even in our most vaunted periods, sufficiently scarce; and our numbers of scientific and judicious breeders have at no period formed the majority. The average, however, of English horses, has possessed a fair proportion of the English principle. Hence their being always in demand for foreign studs. "The coursers of the East," says Mr. Youatt, "might have been easily procured; a new supply of Arabian blood might have been obtained from the native country of the Barb; but French and Italians, Germans, Russians, and Flemings, have flocked to the British Isles. The pure blood of the present Barb and Arabian has been postponed, and all have deeply drawn from that of the thorough-

bred English horse. This is a circumstance with regard to which there is no dispute. It is a matter of history, and it is highly creditable to our sporting-men and breeders."

This national principle of horse-breeding consists in matching the horse and mare in respect to size, substance, blood, and a certain conventional symmetry, so as to obtain a form in the foal, in which may subsist a union of strength and ability for labour, with the powers of activity and speedy progression. We proceed on the principle that, generally speaking, "like produces like," although to this rule, like most others, exceptions appear.

As we imported foreign horses, invariably improving upon those models, so we originally imported the art of farriery and veterinary science from the schools of Italy and France, improving upon them likewise. In the earlier periods of which we have been treating, the farriers of note, and the riding-masters in England, were generally Italian and French. They were, indeed, sufficiently barbarous and unenlightened; but our native artists were inconceivably more so, when the length of time is considered, through which their art had been in universal practice in all its branches.

PONIES AND GALLOWAYS.

There is still one breed of horses, which may be considered aboriginal in Great Britain, and which is the Shetland ponies—called *Shelties* by the natives of Scotland. The description of these astonishing little animals almost exceeds belief. They are less in size than the Orkney horses; for some are but nine, others ten hands high; and they are thought big horses if eleven; but although they are so small, they are full of vigour and life. Some of the smaller sizes often prove the strongest. Many of them are so diminutive that an able man could lift them up in his arms; yet it is said they will carry him and a woman behind him eight miles forward, and as many back. Summer or winter they never enter a house, but, in some places, run upon the mountains, in troops; and if, at any time, in winter they are straitened for food, they will descend from the hills when the ebb is in the sea, and feed upon the sea-weed. Winter storms and scarcity of food, bring them frequently so low that they do not recover their strength till about the end of June, when they are at their best. They live to a considerable age, reaching twenty-six, twenty-eight, or thirty years; and are good for riding at twenty-four. Those of a black colour are esteemed the most capable of endurance. The pied often prove not so good. The smallest of the breed are in the northern isles of Yell and Unst. The coldness of the air, coupled with their scanty provender and hard usage, may influence their growth to a large extent; for, even if bigger horses are brought into these islands, their offspring will, in a little time, degenerate.

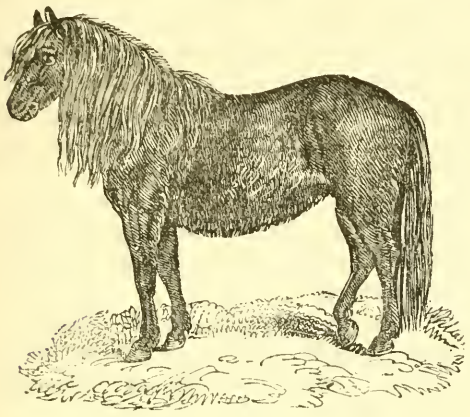
After viewing these little shelties, which are almost of as much importance to the cotter of their country, as the fleet Arabian of the desert is to his master, we feel lost in admiration at the wisdom of that Power who has adapted animals just to suit the situation in which they can be of most service to man.

We, now and then, see some of these small creatures in the southern parts of England, harnessed to a light garden chair, or sometimes carrying an almost baby rider. There are several of them in Windsor-park. It would be curious to watch the stock of these little animals, and to see what improvement, in size, a richer pasture would have upon the smallness of their original breed.

Besides the Shetland, there is the Highland pony, which is not pleasant to ride, except at a canter. His habits make him hardy, for he is rarely housed in the summer or the winter. The Rev. Mr. Hall says, that when these animals come to any boggy piece of ground, they first put their noses to it, and then pat on it, in a peculiar way, with one of their fore-feet; and from the sound and feel of the ground, they know whether it will bear them. They do the same with ice, and determine, in a minute, whether they will proceed.

The Welsh pony is one of the most beautiful little animals that can be imagined. He has a small head, high withers, deep, yet round barrel, short joints, flat legs, and good round feet. He runs with great speed; has a wild and roguish look; and is just such an animal as a spirited girl of sixteen would delight to be perched upon. When seen tossing his mane on the sides of his native mountains, no quadruped can be more attractive. The Welsh ponies are said to be indebted to the celebrated

Merlin, for their form and qualities. They will live on any fare, and can never be tired out.



WELSH PONY.

The New Foresters, notwithstanding their Marsk-blood, are generally ill-made, large-headed, short-necked, and ragged-hipped; but hardy, safe, and useful; with much of their ancient spirit and speed, and all their old paces. The catching of these ponies is as great a trial of skill, as the hunting of the wild horse on the Pampas of South America, and a greater one of patience.

A large number of ponies, of little value, used to be reared in Lincolnshire, in the neighbourhood of Boston; but the breed has been neglected, and will, probably, be suffered to die out.

The Exmoor ponies, although generally ugly enough, are hardy and useful. A well-known sportsman says, that he rode one of them half-a-dozen miles, and never felt such power and action in so small a compass before. To show his accomplishments, he was turned over a gate at least eight inches higher than his back; and his owner, who rode fourteen stone, travelled on him from Bristol to South Molton, eighty-six miles, beating the coach which ran the same road.

There is, on Dartmoor, a race of ponies much in request in that vicinity, being sure-footed, and hardy, and admirably calculated to get over the rough roads and dreary wilds of that mountainous district. The Dartmoor pony is larger than the Exmoor, and, if possible, uglier. He exists there almost in a state of nature. The late Captain Colgrave, of the prison, had a great desire to possess one of them of somewhat superior figure to its fellows; and having several men to assist him, they separated it from the herd. They drove it on to some rocks by the side of a tor, an abrupt pointed hill—a man following on horseback, while the captain stood below watching the chase. The little animal being driven into a corner, leapt completely over the man and horse, and escaped.

The horses which were formerly used in Devonshire, and particularly in the western and southern districts, under the denomination of pack-horses, are a larger variety of the Exmoor or Dartmoor breed. The saddle-horses of Devonshire are mostly procured from the more eastern counties.

It was, we believe, Buffon's opinion, that all horses have been derived from one common stock, and the difference between them in point of strength, size, speed, &c., has been accomplished only by food and climate. This, however, has been disputed; and the question may be difficult to answer, whether the pony and large English horse were, or could be, originally from a common stock. It is, however, not impossible that they might have had one common origin; for if we reflect on the changes which the different modes of feeding effect in the condition of animals, it is not so improbable as it may at first appear.

Without pausing to discuss the question whether a horse will represent in size what it feeds on, we adduce a circumstance which has some bearing upon it, and which fell under the personal observation of the gentleman to whom we are indebted for it. His father had a mare that brought him no less than fourteen colts, and all by the same horse, and not one of which, at three years old, was under seventeen hands high. She was in the fifteenth foal by the same horse, when he sold her to a neighbouring farmer, reserving the foal, which was to be delivered in a twelvemonth.

At her new master's, she was comparatively starved, and she came back at the expiration of the year, so altered as scarcely to be recognised. The foal, four months old, was very small. The little animal was put on the most luxuriant diet, but it did not reach more than fifteen hands high, at the expiration of the third year.

Dr. Anderson says that there was once a breed of small elegant horses in Scotland, similar to those of Iceland and Sweden, and

which were known by the name of Galloways. The best of these sometimes reached the height of fourteen hands and a-half. One of this description he possessed, it having been bought for his use when a boy. In point of elegance of shape, it was a perfect picture, and in disposition was gentle and compliant; it moved almost with a wish, and never tired. The Doctor rode this little creature for twenty-five years; and twice, in that time, rode a hundred and fifty miles, without stopping, except to bait, and that not above an hour at a time. It came in, at the last stage, with as much ease and alacrity as it had travelled the first. The Doctor says, he would have undertaken to have performed on this animal, when it was in its prime, sixty miles a day for a twelvemonth running, without any extraordinary exertion.

A Galloway in point of size, whether of Scotch origin or not is uncertain, started when coaches were running, from London with the Exeter mail; and, notwithstanding the numerous changes of horses, and the rapid driving of that vehicle, it arrived at Exeter—one hundred and seventy-two miles—fifteen minutes before the mail. A gentleman who saw this animal about twelve months after his wonderful performance, described him as being wind-galled, spavined, ring-boned, and a lamentable picture of the ingratitude of man towards a willing and faithful servant.

In 1754, Mr. Corker's Galloway went one hundred miles a-day for three successive days, over the Newmarket course, and without the slightest distress.

A Galloway belonging to Mr. Sinclair, of Kirby-Lonsdale, performed at Carlisle the extraordinary feat of one thousand miles in a thousand hours!

Galloways have greatly decreased in point of numbers. Many of those which are now in use, are obtained either from Wales or the New Forest. The Galloway is supposed to have originally been of Spanish extraction.

CHAPTER III.

GENERAL OBSERVATIONS ON THE HORSE; THE SUPPOSED DEGENERACY OF THE RACING BREED, ETC.

Before considering our Racers, and their kindred breeds in this country, it may be as well to make a few general observations on the racing animal, and the supposed deterioration of his blood. The subject is one of great interest, and merits the thoughtful consideration of all those who are more especially connected with the genus *equidæ*. Some have supposed that the deterioration may have arisen from the fashion of the present mode of breeding for length of stride, and for short races. This, however, might be easily altered by our present stock, without proceeding to the necessity of employing fresh blood to invigorate it. There are others, again, who insist that nothing less than a national establishment will prevent our horses from becoming sorry jades.

The English horse is so identified with the glory of the country, that we could hardly look upon any one as possessed of patriotic feelings, who would see, without a sigh, the degeneracy of our native breed.

There is, at present, one circumstance, however, which places us in a novel situation in respect to the horse, which time only can develop. We allude to the effect that railroads may have had upon the breed. It is a well-known fact, that, at the commencement of the railway system of travelling, many spirited coach-proprietors gave almost hunters' prices for their cattle, and that there was a regular demand for horses of any size for the use of coaches. This traffic having in a considerable degree ceased, it will become a matter for consideration whether there will be any stimulant for breeding sufficient to carry it on with profit and spirit; or whether it will be abandoned, and treated with indifference.

In the event of such a misfortune, we confess we should have hailed with joy a national, or any other establishment which might have had the effect of preserving to us our present breed. We will not say the time may not come when the legislature may be called upon to devise some plan to prevent a native degeneracy, if needed; because we feel convinced that that, or any other measure, would be resorted to, to prevent what would be considered a national calamity, if not a real disgrace. There formerly were, and still are, two opinions upon this subject; and fearing that there may be some truth in the degeneracy of the racing blood, although not, we hope, to the extent entertained by the projector of a national establishment, whose plan was published some years ago; yet, as the subject has a certain interest, we preserve the general features of the scheme propounded.

If we admit, for the sake of argument, that our horses, now-a-days, are neither so durable, nor possess the speed of an Eclipse or a Childers, does it follow that the breed has become degenerate? Are the circumstances in other respects so exact, that we have no other alternative than to place it to the score of degeneracy? Has the racing blood of this country become so intermixed and assimilated, as to have produced the inconvenience, and to have become the opprobrium of good breeders; in short, has our racing blood arrived at that pitch of relationship, which constitutes what is called breeding "in-and-in?" Is the management of racers now as formerly?

Both Eclipse and Childers were about six years old before they raced; and at the present day, horses run at two and three years old. Is it to be expected that animals worked at so tender an age, can be durable? We only ask whether the difference of management between running horses at five or six, and two or three, may not account, at least, for their want of durability?

The following are the remarks of the projector of a NATIONAL ESTABLISHMENT, upon the course which should be pursued in reference to this subject, should it ever be taken up by government.

A national establishment should commence its functions by obtaining from the East a considerable number of well-selected ponies. The better portion would be found to possess much natural speed, stoutness under severe exertion, with limbs and feet peculiarly adapted for moving rapidly on a hard surface. It would be puerile to bring from so great a distance, such ill-shapen and attenuated creatures as those now usually imported under the name of Arabians; or to employ persons to purchase, who have not had experience of the best horses under severe exertion. They would search in vain amongst Orientals for those properties which are acquired under a system of continued selection. Looking only for natural qualities, they should select animals as nearly in a state of nature as they can find them; having good symmetry, a full amount of muscle, and whatever natural speed the best animals of the best race are found to possess.

When brought to England a further trial should be made. In this we should be content with a degree of speed which is natural, and an amount of structural power as nearly natural as could be procured. The offspring of these small horses should be tried in each succeeding generation; and we should be satisfied, for a few years, to see the natural speed of the race gradually augment; retaining only for breeding such as went through their trials satisfactorily.

It would be folly to buy horses of large structure in the East, as such would be found to have less speed than the smaller ones; while factitious structure can be given by ourselves with only too much facility.

Whenever the public shall become alive to the deteriorated condition of our saddle-horses, and anxious to obtain such as are more useful, the first step must be a recurrence to nature for those properties which art has destroyed. It has been shown that, in the absence of fresh blood, the elongated skeleton of the modern racer can only be shortened by a process which would render him a starveling. The character of the whole race has been reduced, in this respect, to a common level. Some individuals may be more compact than others; but all have lost something which fresh blood only can restore. If we rear them at a reasonable expense, their growth is stunted —if on rich grass, they lose their speed. Whether we try to renovate this exhausted race, or substitute another, the objects we seek are a more compact form and greater

vigour; and these can only be found in horses which are nearer to a state of nature. So long as individual differences in a race enable us to correct individual defects, we may dispense with fresh blood, but no longer.

A national establishment, having selected horses from amongst a fine race, distinguished by their symmetry, their natural speed, and full amount of muscle, should carefully observe how far the artificial properties afterwards given to the race, diminished its natural ones. A mass of facts would, after some years, be obtained and recorded, calculated to throw, for the first time, a steady light on the distant, as well as proximate, consequences resulting from factitious causes. These facts are not likely to be collected under any system less permanent and comprehensive than one under the control of a national establishment. Its stock should be divided into two portions; both should be placed under the influence of continued selection for speed and stoutness; but one should be maintained at a structure as nearly natural as possible. With such conflicting properties as speed, vigour, and great structural enlargement, a reserve of more natural animals cannot be dispensed with. The enlarged portion of the stock should again be divided into two classes, one being kept for breeding, the other for working. The size of the former should be allowed to become as large as is required to enable it to produce animals sufficiently powerful for working; every effort should be made to keep down the stature of the breeding animals to that point which suffices, by the aid of rich food, to produce working animals sufficiently powerful; increasing the stature of the race as little, and that of the individuals as much as possible. In breeding horses of the best race, it might be found desirable to have one portion of less speed, but more muscular, than the other, in order to meet that variety of demand which necessarily exists in a highly civilised nation. There should be a certain amount of foreign blood in the horses of our heavy cavalry; but foreign horses, having a degree of speed which is incompatible with much muscular power, are not so well calculated for heavy cavalry as such as have less speed, but more muscular and constitutional power. Mambrino, Sweet-william, or Sedbury, were better fitted for producing proper stock for cavalry than Sharke. This animal was more advanced by art than the earlier horses as respects speed; but he was not so well calculated for enabling us to produce powerful saddle-animals. If a foreign race is to assist in the production of our heavy cavalry horses, it should possess as much structural power as can be combined with a sufficiency of action, vigour, and sustaining strength.

The natural qualities of the horse are found nearest perfection when they are in a condition the least removed from one of nature. Artificial structure is obtained by rich food, and artificial speed by continued selection. The course of the breeder is easy, so long as it is in one direction; that is, in advance. When, however, the form of a whole race has become deteriorated, the symmetry, which is lost, can only be recovered by going back to nature. A national establishment would, in this case, renovate the enlarged portion of its stock by having recourse to the animals whose stature had been little increased. Such an institution should ever be at work, preparing smaller animals, by means of trials and continued selection, for being crossed when required with that enlarged portion of its stock which, from time to time, became deteriorated. The smaller animals, until wanted, should be kept in a state of nature as nearly as possible. They would thus retain their vigour while acquiring all the advantages derivable from continued selection; they could be maintained at the least possible expense; at one which the sale of the annual draughts would nearly or wholly repay.

If a new race were to be formed, under the system we have now recommended, capable of running long distances, and carrying considerable weight without distress, premiums might be again granted to the winners of certain feats upon the turf. To attempt to make modern racers run longer distances, or carry more weight than at present, would be both cruel and useless. A national establishment, undertaking to form a new race of foreign horses, could not be said to succeed, unless it supplied the country with as swift, stout, and powerful animals as were the earlier racers. Knowing accurately the powers of the new race, it could point out the nature of the

running for which premiums might properly be granted; and great tasks might again be performed on the race-course without any of the cruelty which attends the present modes of running.

The stallions, whose stature had been adequately enlarged in the establishment for supplying the demand of the farmers in the great breeding counties, should be let out under strict regulations, or, in those counties, maintained by the establishment in a condition best calculated to preserve their vigour. Mucilaginous food, and other expedients, had recourse to, by private individuals, to make the animals very fat, should not be resorted to. The stallions of a national establishment should make their way to public favour by the goodness of their stock. No horse should leave the establishment, as a stallion, labouring under any essential defect. If a public establishment supplied the breeding counties with the best class of stallions at a cheap rate—bred within its own precincts—the public would be enlightened by example; and, becoming gradually accustomed to see the best forms, would no longer be satisfied with bad ones.

In determining the utility of some such plan as here proposed, the reader will do well to ask himself the following questions. Is there a strong disposition in every fine race of the horse, whose structure has been enlarged by unnaturally rich food, to become either coarse or weedy? Are the plans adopted on the race-course, to prevent coarseness, more than palliative? And are not some of them objectionable? Is it not better to recur to nature, when art has disposed a domesticated race of horses to coarseness, than to such a palliative as that of breeding on one side from old parents? Is not this substituting weediness for coarseness? If we adopt a system under which both coarseness and weediness are avoided, by recurring, when necessary, to fresh blood, we should be able to rear and work horses at the least possible expense. Under this system any essential loss of vigour would be instantly repaired by the most economical means. In maintaining vigour in a race of horses without coarseness, we should have laid the best foundation for giving to it those artificial qualities which result from annual trials, and continued selection. It is in our power to modify greatly the acquired, as well as the natural, properties of Oriental horses; but we cannot combine the highest degree of transient speed with the compact skeleton and muscular power displayed by the earlier horses, and required when great distances are to be traversed, or much weight to be carried.

The practical utility of the projector's plan and speculations may create doubt in some minds as to the propriety of ever adopting them to the extent of his views. They may, however, stimulate inquiry, and, at some period, be productive of all the benefit the most sanguine may anticipate. It is a subject of vital importance, and of grave deliberation.

We hear of much despondency expressed that our breed of horses will die out, and that its advantages, some of our continental neighbours are of opinion, will not long remain with us: they are fully aware of the source whence we derived this superiority, and, in consequence, have endeavoured to establish races on the English plan, which, together with a more careful selection of stallions and mares than we observe in England, will very soon, they say, enable them to excel us; and they anticipate a day, not very distant, when we must send to the continent, if not for speedy, at least for sound horses. This hint about soundness may be worth attention; but, for the rest, there can be little to apprehend.

The following account for the demand of the racing blood of this country, would, however, make it appear that, in foreign countries, the English race-horse was, at no distant day, held in great estimation.

England, where, during the last century, the improvement of her breed of horses has been cultivated with unwearied zeal and a lavish expenditure, is now reaping a golden harvest in return for her enterprise and spirit. Purchasers arrive from the four quarters of the globe. America has taken up the speculation with an ardour worthy the scion of "the old country;" and France, more especially under the reign of Napoleon the Third, seems to think it even of national importance to encourage the breeding of horses upon a better principle than that of crossing the Flanders mare with the Norman stallion. With the view of turning the attention of the

French farmer to a new source of rural industry, the royal breeding stud in Normandy is conducted on a scale of which we have no example in this country. Their stud of stallions is enormous; and during the season, many of the best sort are sent all over the country.

Germany purchased largely of our best blood: Holstein, Belgium, Denmark, and Russia have bought from us: but no purchasers formerly came to the English market, or evinced the talent and spirit of the Americans. France will never be a vent of any consequence for our racing stock, *as such.* Her government will import our stallions, and encourage the speculation in others, as the means of introducing a better description of horse for general use, particularly for cavalry; but she will not offer, by the gift of public money, any inducement for the introduction of race-horses into that country.

We have no fear, however, of France rivalling us in the breed of horses, so long as we have the law of primogeniture, and so long as France is without it. The expenses of the race-course will never be supported in France in the same way as in England, on that very account. In a country like France, where property is so divided, and in a country like England, where money is in such masses—the race-course being a luxury as well as a pleasure, becomes the employment of the nobility of the land: the law of primogeniture preventing the division of estates, secures, at once, the experience and the means of perpetuating the breed of horses of the first quality, from generation to generation; and this is one of the causes of our superior breed of horses.

In fact, France does not require such a breed. She has, comparatively speaking, very few customers for thorough-bred horses, which would rather encumber than be useful to her. Beyond the army and the court, there are not many Frenchmen but would be content with a moderate-priced horse; and, we believe, would rather avoid the extra care and attention which a higher-bred animal might subject them to. The French, as far as our experience goes, are an economical people, not likely to encourage any expense which they possibly can do without; and therefore are perfectly contented with their present breed. There are no hounds kept in the provinces, because there are no primogeniture estates of twenty thousand pounds a-year to support them; there are no subscription packs, for the same reason that there are no private ones: property is so divided and subdivided, that if it secures comforts, the people are satisfied, and are too wise to embark in anything which they deem extravagant. There is no encouragement to stimulate the breed of hunters; and the breed of blood horses will, we suspect, remain limited, rather than be greatly extended.

We avail ourselves of the following description of a breeding stud, which will confirm the above observations, and show to what extent the breed of the English race-horse was, not many years back, kept up by our native gentlemen sportsmen.

Within a few miles of Thetford, in Norfolk, and almost adjoining each other, were situated two of the most celebrated breeding establishments in England—Riddlesworth and Euston; the former, the seat of Mr. Thornhill; the latter, of his grace the Duke of Grafton. The proudest feature in the social condition of the land we live in, is, that the promotion and support of objects of national importance which everywhere else is looked upon as the business and peculiar province of a government, either originates in individual enterprise, or is the result of public spirit, supported by private wealth or influence. Two princely instances of this are before us. Here a *national* business—it is such, in fact, because no other country possesses the material, or the knowledge of its use—which from its nature is not suited to the merely professional man, is conducted with all the care and skill that could be brought to bear upon any undertaking solely embarked in for the purpose of a profitable return.

The Riddlesworth stud consisted of thirty mares. In loose boxes were three of Mr. Thornhill's yearlings, about to be sent to Newmarket. A bay colt, by Emilius, out of Mercy, attracted considerable attention on account of its size; it was a horse in all but the name. Some Russians who visited Riddlesworth, absolutely refused to believe it, till they looked into its mouth. The second was a chesnut colt, by Sir Patrick, out of Mangle-wurzle, with size and substance for a four-year-old. The third,

a bay colt, brother to Mendizabel, by Merchant, out of Misnomer's dams. These three yearlings averaged, each, fifteen hands two inches high!

As far as the example of these yearling colts go, there can be no cause for suspecting degeneracy; for, with their immense growth, they had substance as well as height—one of which might be taken for four years old. If these splendid and gigantic animals had had justice done them, they would not have been put to severe work before five or six years old; yet they were going into training at Newmarket directly. Where there was so much strength and substance developed at so early a period, surely it cannot be unnatural to suppose that, if time were given for the consolidation of those powers, instead of racing them at two years old, we should not have to deplore the want of durability in our racing-stock. If we sin against nature, however, we must take the consequences; for we can never do that with impunity.

It might be interesting here to draw a comparison between the English racer and the parent stock, as to the difference between them in point of size. The principal cause of this, perhaps, arises out of the superior kind of food which the one receives to the other, and which thus increases the structural economy of the animal. We will, however, rather proceed to give a description of two of the most beautiful Arabs ever seen in this country. They were a present from an Eastern prince, the Imaum of Muscat, to his majesty William the Fourth, and show the difference, in a most striking manner, of the present breed of English racers to that from which they are derived.

The first was a black stallion, standing fourteen hands three inches high, branded M on the off-quarter. This horse was the most esteemed of the two; his colour, in Arabs of the highest class, being rarely or ever met with. Years were consumed in selecting this pair sent to his majesty, and no limit put upon their price. Great as the difficulty has ever been to convey a just idea of the horse with the pencil—to put upon paper, words to effect such a purpose, is a ten times more hopeless task.

The first impression that the sight of this little, unpretending animal, made upon one, was anything but such as are in accordance with our usual anticipations. The issue was precisely such as one experiences in contemplating a highly-finished picture—the more you gaze upon it, the more its beauties become developed. In this country, we are by no means familiar with the Arab—many have not even seen one: but if the portraits with which every sportsman is familiar of the Darley or Godolphin Arabians, be faithful delineations of the animals they profess to represent, the whole model of the Arab horse, as shown by the one in question, differs *toto cœlo* from them. "Here I had before me," continues the author of this description, "one, selected by a prince whose subjects have ever been celebrated for trafficking in the purest blood of the desert. I could not doubt his claim to legitimacy. I have said his height is fourteen hands three inches; his form so angular, that at the first glance it seems to defy all claim to symmetry. The whole character of shape and bearing is closely allied to that of the deer. When you come to a minuter examination of the parts, individually, then you are convinced how pure the fountain must have been whence such blood was obtained. The head of this horse can be likened to nothing but exquisitely chiselled marble; there is literally *no* flesh upon it; it is marble, too, to the touch. The eye is small, but clear to transparency; the cheek-bones are prominent; and there is a fixedness about the ears that helps you to think you are really looking upon the work of the sculptor. The jaws stand very far asunder, the nostrils are large and high, and the windpipe is of an extraordinary size. The neck is light, and set on similarly to the deer's: the shoulders more fleshy and upright than suits our taste; but, below the knee, the legs are perfection: you find quite as much bone as in the largest sized English blood-horse, and the tendons are in your grasp like iron. His carcase, without being very full of substance, is round, and tolerably deep; his quarters, what we express by *vulgar*. His thighs are very thin and sinewy, his loins narrow, his hocks perfectly clean and slightly inverted—he is what we call 'cat-ham'd.' The tail is well set on; the dock small; the hair fine and scant, giving it the appearance of a mule's more than that of a horse. His shanks are short, and hard as

adamant; the pasterns flexible; the hoofs singularly hard, but healthy; and the feet open and roomy. You read his temper in his eye; he is a light-hearted animal, without the slightest taint of vice."

The other stallion, a bright bay, is described almost in the same words. His head is less perfect, and the bone smaller; but his quarters are fuller, and more softened down by the swell of the muscles. His back, which, like the other, is rather inclined to be hollow, is not more than eight or ten inches from hip to shoulder. "I never saw a pony's so short. His height is, as nearly as possible, the same as the black; in middle piece he has the advantage. They were both brought out for me, and I saw them in all their paces. In their action, as in their lean, spare forms, you detect nothing superfluous; it is quiet and graceful, and entirely without any expression of exuberant exertion. Utility is the characteristic of the Arab horse. I can imagine him going for days together without fatigue: nature intended him for this, and she has fitted him for endurance. The impression of his extraordinary speed was long a vulgar error, which is now fast exploding. No Arab that ever trod the sand, could live in company with an English race-horse, weight him for inches, or after any fashion you will: with the size of a Galloway, you cannot have the stride essential to great velocity. Speed, regular and long sustained, no doubt he possesses: our blight of degeneracy is yet unknown to the desert-bred. Before I part with these horses, I cannot but regret that one or two of the mares at Hampton Court were not put to them. Surely nowhere could the experiment have been so properly made. That their stock in the first, or tenth generation, could compete with Emilius or Sultan, no one supposes; still they are crystal streams, fresh drawn from the spring, whence it is acknowledged we derived the fertilisation of our own turf. If only to trace its progress, it might be a useful lesson, probably a guide of great importance."

In giving the description of these two very extraordinary high-bred Arabians, selected by a prince who spared no expense, and brought from his own dominions, which is a country also renowned for the breed of horses, we cannot but suppose that these specimens were of the very highest caste, and the perfect representations of their kind.

The gentleman to whom we are indebted for the description of these two beautiful small Arabs, says that there is no resemblance whatever between them and the portraits of the Godolphin and the Darley Arabians. This, no doubt, is very true; for these were horses of considerable size and power, and their immediate descendants became racers. To them, however, the English breed is so much indebted, that, under the head of the English Racer, we shall have something to say of both the last-named horses.

We shall now return to the stud at Riddlesworth—an establishment which, although only in the hands of a private English gentleman, is sufficient to show to what sort of personages we are indebted for the superiority of the English horse, and for the beauty and speed with which wealth and art have united to invest him.

Our first duty is to introduce our readers to the sires of the three yearling colts, of which we have already spoken, and which averaged fifteen hands two inches high. The following is the description of an accomplished sportsman who visited them.

"I now followed my obliging conductor (the stud-groom) for a visit to the stallions. Their boxes, each with a large walled yard attached to it, are close to his dwelling-house, around which, also, lie various commodious houses for the young stock when it is first taken up, previous to being taken away by the purchasers, or sent for training to Newmarket. The stallions all lie out—that is to say, their boxes are left open; and unclothed, and untouched, they have the run of the yards, night and day, till generally the second week in December. They are then shut up, groomed, and put into condition preparatory to the approaching season. The first I saw was Merchant, by Merlin, out of Quail, by Gohanna. He is a powerful, short-backed chesnut horse, and his stock have shown well. He is a favourite at Riddlesworth, probably on his sire's account, Merlin having ever been high in Mr. Thornhill's estimation.

"Next to him came St. Patrick, by Walton, his dam by Dick Andrews. This is a very

fine-looking chestnut horse, hired, I believe, from Mr. Dodsworth. He is light topped, with a good deal of the character of Actæon about him: his frame is beautifully moulded; his legs, which have tasted the iron all round, well under him; fine withered, deep gaskined, with thighs and quarters quite perfect. He is short in the pastern, a quality pronounced, by most men, as demanding praise, but as little esteemed by me as its opposite, long.

"In the post of honour, the dwelling nearest to himself, Tyler introduced me to the steed whose own performances, and those of his descendants, place him without any parallel in the annals of British racing—Emilius, by Orville, out of Emilius, by Stamford, grandam by Whiskey, out of Grey Dinmont. 'And this,' said I, 'is Emilius!' as a rough-coated animal, with an eye like a star, came snorting up to me. He was quite *en deshabille* to receive company, as it was evident he had been recently indulging in a roll among the mire of his exercise-paddock. The moment I laid my hand upon his shoulder, he stood still, looked complacently upon me, and, notwithstanding his having been surprised a little *mal-apropos*, accorded me a reception quite in keeping with his acknowledged *high breeding*. Taking this horse as the standard of perfection of the English blood-horse of the nineteenth century, I will state, as well as I can, the result of a very careful examination of him, and thence draw such inferences as are relevant to my present purpose. He was then in his sixteenth year; and his height over fifteen hands two inches. In colour he was a rich blood-bay (when in his spring form), with four black legs. He was all over sound, and without blemish, save in his off fore leg, with which there seemed to have been something amiss below the knee. Probably the most skilful anatomist would fail in discovering one point of his symmetry faulty. This latter phrase may require explanation: what I mean by it is, that although his frame should be pronounced perfect, as it was; that in its symmetry, the harmony of each part with the whole, the fitness and relation of every point for its assigned function, defied criticism. You saw before you a form moulded for speed and strength, as the imagination of the most experienced painter would pourtray it. We know that he was swift and strong—let us see if his physical development agreed with the idea affixed by the eye for power.

"'Tyler,' I inquired, 'have you a morsel of string? Never mind,' seeing that he was going to procure it for me at his house. I removed my watch-guard.

"'Ah!' said he, seeing the use to which I was about to apply it, 'you are going to measure his leg I see: well, I have not seen such a thing done since the time that his royal highness the Duke of York was staying at Riddlesworth. The duke, I remember, came one morning, and took the size of Merlin's near fore-leg just under the knee, and its circumference was full nine inches and a quarter. Now, sir, I like Emilius's leg much the best: it is shaped, as I call it, *like a fiddle, with the strings standing well out from it*, the way that a horse's muscle and sinew should do.'

"Having carefully taken my measurement of his near leg, I entered it in one of the leaves of my pocket-book. It is now before me, and gives the circumference at exactly eight inches and a-half. This was a little less than the measurement of the off-leg. I need hardly remark, that the apparent advantage on Merlin's side is easily explained, if his limb was rounder, and consequently less oval than that of Emilius. This would give him, however, no actual superiority, the shape of the bone and sinew of a horse's leg being an oval—shallower, of course, as it extends from bone to muscle. For this horse, I was given to understand, Mr. Thornhill refused eight thousand pounds.

"Nothing could be more characteristically English than the establishment at Riddlesworth. Tyler, the stud-groom, was an honest, obliging yeoman, with his mind on a level with his calling. The stock which he produced and reared during a long period of superintendence and care, was the best evidence of his fitness for such occupation. I spent a few minutes in his cottage, and it was just the head-quarters in which I should have expected to find him. Everything was scrupulously neat; all the comforts that his condition could require, were there in abundance; and the elegancies were in perfect accordance. The walls were decorated with the most cele-

brated feats of the white and scarlet. There was Sam winning the Derby in 1818; Sailor, victorious for the same stakes in 1820; a fine plate of Orville; and one of Herring's admirable likenesses of Emilius. In front of his dwelling ran a sparkling stream, and just beyond it was a moving zoological panorama, such as no nobleman in the land could show, and which may be called a description of the once celebrated stud at Riddlesworth."

In France, as already observed, there is not the same inducements as in this country for fostering and encouraging thorough-bred horses. Napoleon I. used to send studs into the different French provinces, to maintain the highest breed. One of these, at Auch, capital of Gascony, consisted of horses of various countries—the Arab, Barb, &c.; and among these was one which attracted much attention. He was an English thorough-bred, standing full sixteen hands high; was called Romulus, and was said to be above thirty years of age. He had all the appearance of age, having lost his flesh; but there was his eye and noble forehand, which indicated both dignity and high breeding. There was nothing to resemble him. The other stallions were full of flesh and pretty; but the English horse, for size and speed, never could appear to more advantage than when in such company. They certainly were handsome and beautiful to look at; but Romulus had the same appearance of nobility and dignity over his tribe, as may be supposed to have been possessed by John P. Kemble, in Coriolanus, over a common actor.

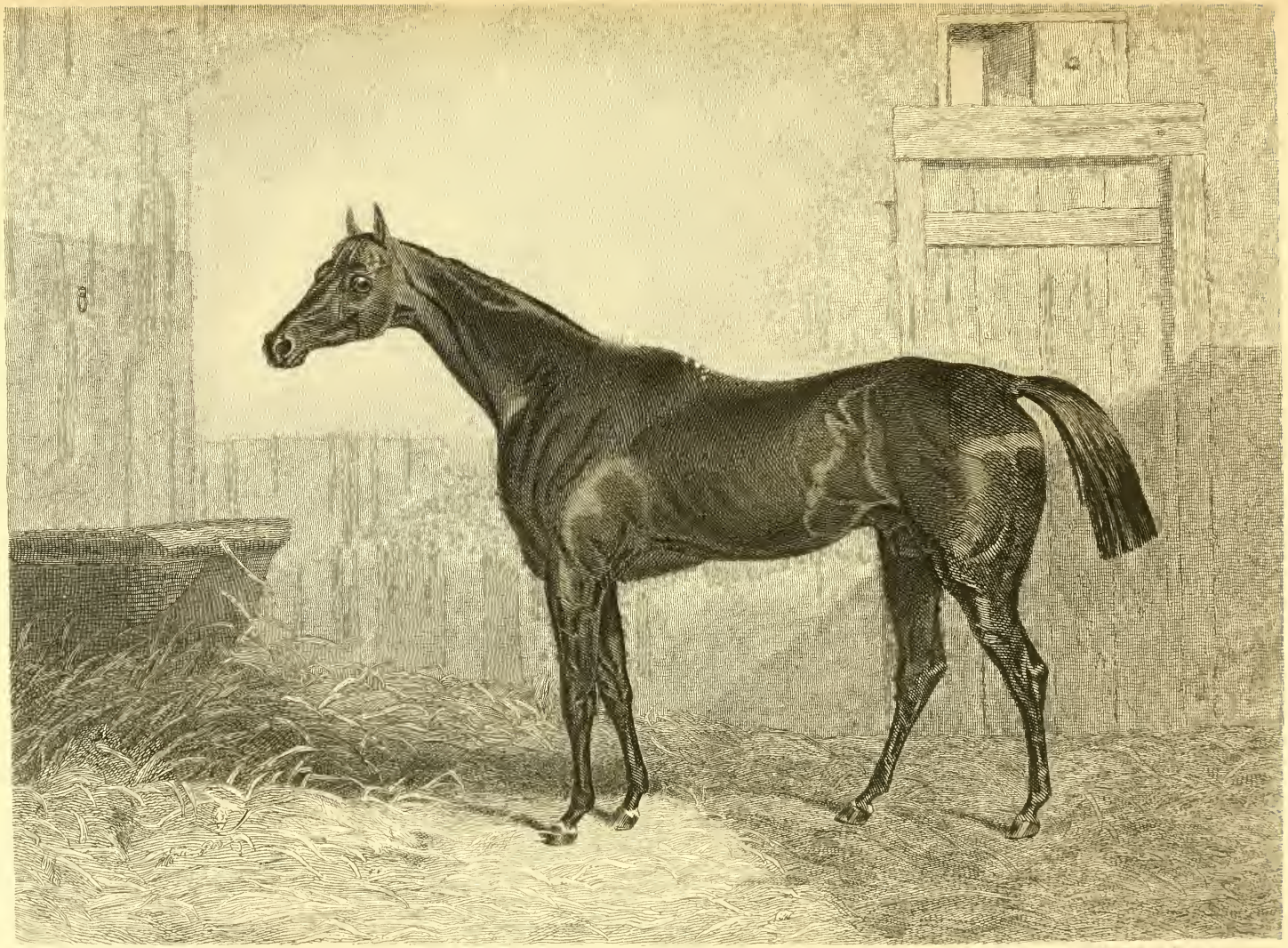
We have spoken of the division of property in France being very minute; and in Gascony, especially, most of the farms are very small, and cultivated chiefly by their proprietors. In many of these patriarchal abodes will be found the great-grandfather, surrounded by a portion of his descendants, at the same fire; for here the daughters bring their husbands home; and it is a pleasing sight to see them all engaged in one general interest and pursuit: the young girl handling a pitchfork, and filling the cart, with as much animation and zeal as her brothers. But—

"England, with all thy faults, we love thee still."

Here we see the large broad hand, and the hale complexion of wholesome labour! We turn our thoughts to Manchester, to Sheffield, Birmingham, &c., and the thin, pallid, emaciated appearance of their inhabitants; and we never feel the contrast so strong between the happiness of the followers of agriculture, and that of those engaged in manufactures, as at the time when we compare the harmony and quiet incident to rural pursuits, with those of the city. With the condition of riches we have here nothing to do. It is of the conditions of men we are speaking; and what we are mostly thinking of, is the barn with its wheat; the yard with its dogs, cows, pigs, and poultry; the fields, and the horses.

Since the days of Napoleon I., we should think the breed of horses may have, in some degree, improved in France, as a tolerable sprinkling of English mares would have been left in that country by the army of occupation; and a long peace no doubt enabled the French government to avail itself of all opportunities to improve their breed. It is therefore natural to suppose that her cavalry and artillery may now be better horsed than they were. Hunting, however, is not a popular amusement in France. The Revolution took away the game-laws, and the rights of the Seigneurs; nor would the present race of French farmers submit very quietly to witness their lands traversed by dogs and a field of horsemen; therefore, we do not suppose that there is any probability of hunters being wanted beyond the royal chases.

England is therefore so differently situated to France, that what may suit one country, and, in its effects, may be beneficial, to the other might be considered a nuisance. A farmer, in England, surrounded by the squirearchy of his neighbourhood, and partaking of the joys and amusement of the chase, thinks nothing of the damage which a field of horsemen and dogs may do to his corn-crop; believing he may be repaid for the damage done by their encouraging the demand for horses, of which he is himself the breeder. However, if he does complain, and there is reasonableness in the demand, there is always wealth enough, and we believe liberality enough, to indemnify him for any damage he might sustain on account of the hunting establishment; consequently he becomes a partner and preserver



of the sport, in protecting the foxes, so essential to the amusement of the chase, and is looked upon as a favourite in his aristocratical neighbourhood—a circumstance which insures to him respectability and position.

In France, where, comparatively speaking, there is little disproportion of wealth, it would be, we think, impossible to create any hunting establishments that would be of a nature sufficiently large to be an encouragement for superior-bred horses. As to breeding these for the turf, we believe there will be a very few studs of thorough-bred horses kept. Looking, then, at France in this view, we do not think she will take the palm of breeding the best horses from us. Neither do we think such horses necessary for France; if she obtain a good breed, it is sufficient for all useful purposes, without straining after that which, without inordinate wealth, might prove an incumbrance rather than an interesting posesssion.

CHAPTER IV.

BREEDS OF ENGLISH HORSES.

THE RACER.

BEFORE entering on our description of the Racer, we will briefly trace the rise and progress of the English race-course, which has long enjoyed a world-wide renown.

It has been customary, says the elder Randal Holme, one of the city heralds, time out of mind, upon Shrove Tuesday, for the Company of Saddlers of the ancient city of Chester, to present to the drapers a wooden ball, embellished with flowers, and placed upon the point of a lance.

Mr. Lysons, in his *Magna Brittania*, mentions some old articles of a race, for two bells, among the corporation records, the earliest date of which was 1512.

This ceremony was performed in the presence of the mayor, at the cross in the Roody, an open place near the city. "But this year of 1540," continues Holme, "the ball was changed into a silver bell, valued at three shillings and sixpence, or more, to be given to him who shall run the best and furthest on horseback, before them, on the same day, Shrove Tuesday."

In 1610, Mr. Robert Ambrye, or Amory, ironmonger, sheriff of the City of Chester, at his own cost, did cause three silver bells to be made, of good value, which bells he appointed to be run for with horses, "upon St. George's-day, upon the Roode Dee, from the new tower to the netes, there turning to run up to the water-gate; that horse which come first there to have the beste bell; the second to have the seconde bell for that year, putting in money and sureties to deliver in the bells that day twelvemonth." The other bell was run for on the same day, upon the like conditions. These trophies were taken to the course with much pomp and ceremony. Chester races are now held the first week in May, which comes as near the original time (old St. George's-day) as possible.

These bells were denominated St. George's Bells, and, in the last year of the reign of James I., 1634-'5, John Brereton, innkeeper, Mayor of Chester, first caused the horses entered for this race, then called St. George's race, to start from the point beyond the new tower, and appointed them to run five times round the Roody; and, according to the younger Randel Holme, "he who run the last course, or trayne, received the bell, worth eight or ten pounds, and to have it for ever, which monies were collected of the citizens for that purpose." By the author's having added that the winner of this race was to have the bell for ever, is implied, that it had been formerly used as a temporary mark of honour by the successful horseman, and afterwards returned to the corporation. This alteration was made April 23, 1624.

Sir Thomas Chaloner, who wrote in the early part of Elizabeth's reign, mentions Henry VIII. as a great admirer of horses, and of his having imported some from Turkey, Naples, Spain, and Flanders, to improve the English breed.

John Northbrook, a puritanical writer, in the reign of Queen Elizabeth, who, though very severe against cards and dice, interludes, and other idle pastimes, allows of horse-racing—a proof that it was no uncommon amusement at that time, when it was considered as a liberal sport, practised for pleasure rather than profit, without the least idea of reducing it to a system of gaming. It is ranked with hunting and hawking, and opposed to dice and card-playing, by an old Scotch poet, who laments that the latter had, in a great measure, superseded the former; and Commenius, in 1590, says that tilting, or the quintain, is used instead of horse-races, which, he adds, are grown out of fashion.

Before the reign of James I., trials of speed were not practised, as at the present day; nor were any horses kept solely for the purpose of running at stated seasons. It is, however, certain that this comparative mode of ascertaining the goodness of horses, was not only, previously to this period, known, but that private matches were made between gentlemen, who, relying on their own skill, rode their own horses.

Soon after the accession of this monarch, who was "inordinately attached to the sports of the chase," public races were established; and particular horses becoming known for their swiftness, their breed was cultivated, and their pedigrees recorded with the greatest exactness. It was now that they began to be trained expressly for the purpose, attention being paid to the quantity and quality of the animal's food, physic, sweats, and clothing: the weights, also, which seldom exceeded ten stone, were rigidly adjusted. Camden says, that most of the celebrated races in the kingdom were called Bell Courses—hence originated the adage, "He bears the bell." In this reign, the value of English horses began to be duly appreciated, and many were purchased and exported to France. Thus, with all the pedantry of this Scottish Solomon, it is evident he was a noted admirer of all that appertains to the horse; and it is easy to imagine him invested in his sporting garb of forest-green, with a feather in his cap, and a horn at his side, contriving, in the most advanced state of age and imbecility, when unable even to sit on horseback without assistance, to follow the chase, although unable to keep his seat in the saddle without being laced, or tied up in it.

Sir Simon D'Ewes, in his Journal, speaks of "a horse-race, near Linton, in Cambridgeshire, in the reign of James I., at which town most of the company slept on the night of the race

Gatherly, in Yorkshire; Croydon, in Surrey; and Theobald's, on Enfield Chase, when the king was resident, were the spots where races were run. The Arabian, for which James paid five hundred pounds, and which was ridiculed by the Duke of Newcastle, was of a bay colour, a little horse, and no rarity for shape. He was trained, but disgraced his country by being beaten in England by every horse that ran against him.

Butcher, in his *Survey of Stamford*, informs us, that a concourse of noblemen and gentlemen met every Thursday in March, together in the vicinity of that town, in mirth, peace, and amity, for the exercise of their swift-running horses. The prize they ran for was a silver-gilt cup with a cover, of seven or eight pounds, provided by the alderman for the time being. This sum was raised out of the interest of a stock formerly made by the neighbouring nobility and gentry, the well-wishers to the town.

Races were held at Newmarket, in the latter end of the reign of Charles I., although the Round Course was not made till 1666. In this king's reign, races were also run in Hyde Park, as appears from a comedy called the *Merry Beggars, or Jovial Crew*, 1641. "Shall we make a fling to London, and see how the spring appears there, in Spring-Garden and in Hyde Park, to see the races, horses and foot?"

At this epoch, however, the country was distracted by scenes which came too closely home to the bosom of every man to allow attention to be paid to subjects which can alone be prosecuted with effect in periods of tranquillity.

Burton, in his *Anatomy of Melancholy*, mentions horse-racing as the disport of great men,

and good in itself, though many gentlemen, by such means, gallop out of their fortunes.

On the restoration of Charles II., the great patron of the turf, this sport, so congenial to the habits and manners of a free people, revived. The glory of Newmarket, long obscured, first by the violent spirit of contending factions, and next by the puritanical sentiments which pervaded the English mind during the Cromwellian era, again shone in meridian splendour. The palace, erected by James I., and which had fallen to decay during the civil wars, was rebuilt for the better accommodation of the "merry monarch," who personally attended, and not only gave public rewards, but kept and entered horses in his own name; thus giving an affable patronage to the sport, at which he seemed to be one of the happiest of the spectators. We are told by the quaint Evelyn that his majesty ran his own horses. "On the 10th October, 1671," says he, "after dinner I was on the heath, when I saw the great match run between Woodcock and Fleetfoot, belonging to the king and Mr. Eliot of the bedchamber, many thousands being spectators; a more signal race had not been run for many years."

When his majesty resided at Windsor, races were held on Datchet Mead: he also occasionally visited other places where these sports were instituted—Burford Downs, in particular, as may be inferred from the following doggrel verses, written by Matthew Thomas Baskervile, about the year 1690.

"Next, for the glory of the place,
Here has been rode many a race.
King Charles the Second I saw here,
But I've forgotten in what year;
The Duke of Monmouth here, also,
Made his horse to sweat and blow;
Lovelace, Pembroke, and other gallants,
Have been venturing here their talents;
And Nicholas Bainton, on Black Sloven,
Got silver plate by labour and drudging."

To Charles we are also indebted for the breed of our present race of running-horses. With a view to the improvement of our native stock, the Master of the Horse, by some said to have been Sir Christopher Wyvill, and by others Sir John Fenwick, was sent into the Levant to procure horses and mares for breeding. The mares thus procured, and also many of their produce, have been styled *Royal Mares*. Dodsworth, though foaled in England, was a natural Barb. His dam, a Barb mare, was imported at this period, and was called a royal mare. When twenty years old, and with foal, after the king's death, she was sold for forty guineas.

At this period, the prizes run for became more valuable. Instead of bells, pieces of plate were substituted, as bowls, cups, &c., usually estimated at one hundred guineas each; and upon trophies of victory, the exploits and pedigrees of the successful horses were commonly engraved, whence, perhaps, much curious information might be obtained, regarding the merits of the various victors. Plates, also, of different value were given in various parts of the country, and which were generally advertised in the *London Gazette*.

William III., notwithstanding the gravity of his character, frequently visited Newmarket; whilst Queen Anne kept race-horses, and entered them in her own name. Her majesty's brown horse, Star, won a plate at York, July 30, 1714, at *four* four-mile heats, the Friday preceding her death, which occurred on Sunday, August 1st. George I., in 1720, discontinued the Cups, as prizes to be run for, and ordered one hundred guineas in specie to be paid to the successful competitor.

As an illustration of the turf manners at about the period at which we have arrived, it is interesting to know that there was, at Newmarket, the keeper of the horses of no fewer than four of our sovereigns. This illustrious individual was Tregonwell Frampton, who kept the running animals of William III., Anne, George I., and George II.

Frampton was born in the troublesome reign of Charles I., in whose time horse-racing commenced at Newmarket, and was the owner of several running horses. Amongst these there was one matched to run against old Merlin, at Newmarket. Merlin was placed under the care of one Heseltine, a groom at Newmarket; upon whom Frampton's groom endeavoured to prevail to run the two horses a private trial at the stated weights and distance agreed for in the match, observing that, by that means they might both make their fortunes. Heseltine refused, but in such a manner as to give the other hopes of bringing him to compliance.

In the meantime, Heseltine took the opportunity of communicating, by a letter sent into Yorkshire, the proposed offer to Sir William Strickland, Bart., who was principally concerned in making the match. The baronet returned for answer that he might accept it, taking care to deceive Mr. Frampton's groom by letting Merlin carry seven pounds more weight than what was agreed upon. Heseltine shortly afterwards consented to the proposal of Mr. Frampton's groom, who had secretly received instructions precisely similar to those given to Heseltine.

These *honest* grooms now prepared the horses accordingly, and ran the course agreed to in the articles; when, after an excellent run, Merlin won by something more than his own length. This being communicated to each party by his secret and *faithful* groom, each flattered himself with certain success. Sir W. Strickland, very naturally, concluded that, as Merlin had proved himself superior with even seven pounds extra on his back, he would very easily win the race; while Mr. Frampton was decidedly of opinion that, as his horse had run Merlin so hard, carrying seven pounds more, he could not fail ultimately to win. In consequence, proposals were made and accepted to an enormous amount, even to an extent greater than was ever known; some gentlemen —in the secret—staking not only all their cash, but other property besides.

At length the hour arrived when this important business was to be decided. The horses started; and the race was won by Merlin by about the same distance as in the private trial. In a short time the secret became known; and, though it had originated with Mr. Frampton, it is certainly not a little singular that Sir W. Strickland should adopt the very same expedients.

Several gentlemen were completely ruined by this race; and it excited so much attention throughout the country, that the circumstance was at length noticed in parliament, and a bill passed in consequence, to restrain the rage for betting.

By this bill it was enacted, "that no sum of money, exceeding ten pounds, betted, laid, or agreed to between any party or parties, in future, shall be recoverable by law."

For a number of years Frampton was styled the father of the turf, and died on the 12th of March, 1727, aged eighty-six.

Let it always be remembered that the grand and important division of race-horses, in respect to their qualifications, is into the stout and the speedy.

By the first term is meant such as are stout of heart, cool in temper, and firm in constitution; generally not remarkable for readiness and speed, but calculated to succeed in a long race. By the second, such as are usually said that speed is their best, it is meant that they are best qualified for a short race, possessing a promptitude in the higher degrees of velocity, which must necessarily be of a relatively short duration. These are generally free, and of a warm temperament; and sometimes, but not invariably, of a weak and washy constitution.

It may be easily conceived, that the degrees of variation or approximation, in both of these respects, must be infinite, rendering it frequently no easy matter to determine positively to which class a horse belongs. As to the extremes, there are horses which have barely racing speed, their sole virtue consisting in their great powers of continuance, by which, in a four-mile race, they were wont to wear out their more speedy antagonists. On the other hand, there are such as no measures of art can enable them to get through a long course in the company of reputed running-horses. These have their distance, beyond which Nature has put it out of their power to go. Of this description were Fireaway, Masquerade, and Rocket of former days. The two first were most successful at the distance of a single mile; the last, at that of one quarter, or half a mile at most. It is not in the course of nature, that phenomena like Childers and Eclipse—to be spoken of immediately—should be often produced, uniting the extremes of both speed and stoutness, giving the go-by and the distance to all possibility of competition. The most useful racer, perhaps, is the animal that partakes in a nearly equal and considerable degree of both qualities, but with a superior turn towards speed. Such was the famous Shark, and such was the opinion of Chifney, the jockey of the Prince of Wales, afterwards George IV.

The expression, *to make the play*, or *to go along*, will be easily understood, as leading

away in a race, at a pace of very considerable speed, upon a horse which is presumed to be stout and long-winded, in order to distress those antagonists which are known, or supposed to be inferior in stoutness. The object of this is, that such as are fatigued and exhausted by long and sharp running, may not have it in their power to reserve their superior speed for the last push. Amongst horses of equal game, the *play* may be made by those which are in the best condition.

Waiting, or *making a waiting race*, is plainly the opposite practice of the above. Here, the rider of the speedy, weak, or jadish horse, always aims to keep in the rear, and go as slowly as possible, until the last few hundred yards, when he well knows his power of speed will be turned to the best account.

Having thus briefly traced the early history of horse-racing in England, and explained some of the terms of the turf, we now come to speak of the selection made of those sires from which our racing-blood has derived its celebrity.

The English race-horse, like the game-cock and the bull-dog, are England's peculiar productions, unequalled for high courage, stoutness of heart, and patience under suffering.

Cockfighting is a wanton and barbarous sport, and is happily now nearly obsolete among the more cultivated classes; and whatever cruelties may happen on the race-course, in the punishment administered by some jockeys to their animals, they are at least not very apparent, if they in reality have an existence at all. That the practices of the turf have frequently been such as to degrade its character there can be no doubt; still, looking at its sport in a national and general way, the emulative spirit which is inspired by our races, is of immense importance in maintaining the character of the English horse. The term thorough-bred, as applied to the horse, both in Great Britain and Ireland, indicates him to be either a remote or immediate pure, unmixed descendant of the south-eastern courser, Arabian, Barb, Turk, Persian, Syrian, Egyptian, or of the neighbouring countries. The preference given to antiquity and purity of racing-blood has always been considered due to the produce of the Arabian and African deserts.

In the general outline of the figure, limbs, the shape of the head, and in the countenance, the modern English race-horse bears the strongest resemblance to the Arabian; but from the great care and high keep which he has through so many descents enjoyed in this country, he is of far greater height and bulk, and equally superior in point of power. Art is the handmaid and improver of nature; and, notwithstanding the boasted speed of animals in the natural state, there is no doubt of the superiority of the trained courser. Thus the British race-horse, even at an equality of size and power to carry weight, is far swifter and stouter in turf phraseology, and more lasting than the natural courser of the desert of the oldest pedigree. Such is the universal experience from trials in this country, and such would, in all probability, be the result, were the rival horses taken young, and trained and tried upon an equi-distant and neutral soil. This opinion may not altogether coincide with the sentiments of those who have been accustomed to read and believe in such narratives as recount, without investigation, the speed and extent of the journeys performed in a given time by Arabian horses. A little aid, however, may be given to the judgment of these gentlemen, by recalling to their minds, that there are no mile-posts in the desert; no clocks or watches wherewith to measure time; no clerks of the course to start the horses, or judges to drop the flag at the ending-post; and that the jockey himself is often the only spectator. He is likewise often the only relater of his horse's performances; whilst in all the Eastern writings, ancient or modern, exaggeration is the predominant characteristic.

In the early periods of the turf, recourse must have been had to foreign horses for racers, and also to the bastard breeds, as they were then styled, or mixtures between foreigners and the lightest native breed of the country. Spanish jennets, the descendants of Barbs, were trained: in short, any well-shaped nag with good action in the gallop, was deemed a racer.

The idea of thorough-breed and its peculiar qualities, had not then taken place; but was, afterwards, gradually and experimentally developed. The mild climate and gramineous soil of this country, always congenial to the nature of the horse, were found highly to improve, in size and power, the progeny of

such horses as were brought from the south. Hence, assisted by the systematic care of our turf-breeders, the British race-horse has been brought to the state of beauty, symmetry, and perfection in which we now behold him, and that superiority which all the world acknowledges and admires.

It is now upwards of one hundred years since, in this country, the greatest attention has been paid to pedigree, and to preserving the racing-breed pure and unmixed. Accidental mixtures there certainly have been, for such are upon record; but they have been comparatively few—mere drops of common, in the grand stream of pure and high racing-blood. Such crosses have been occasionally apparent perhaps for several generations, in the form and qualities of the produce; but they have been obliterated by time, and are not discoverable in the remote descents. Within this period, the phenomenon has now and then appeared of a horse not thorough-bred, such as in the cases of Sampson and Bay Malton proving winning—even capital racers. But such exceptions will not induce experienced sportsmen to infringe the general rule, of breeding from, or training horses for the course, which are not thorough-bred. The same rule holds, however anomalous it may seem, with respect to foreign horses of the purest blood, from which our thorough-breed is derived. None of them—and the experiment has often been repeated—whatever their age, size, or condition, have been found capable of contending on the course, from a race of one hundred yards to one of a hundred miles, with their relatives and brethren in blood—the race-horses of this country.

The ill-success of the Arabian purchased by King James I., and already alluded to, brought the studs of the desert into such disrepute, that we read of but few of them in the scanty annals of the turf, until the reign of Queen Anne, the last of the Stuarts who has occupied the British throne.

THE DARLEY ARABIAN.

Early in the reign of Anne, the famous Darley Arabian was imported. He was sent from Aleppo by Mr. Darley, a merchant, who had settled there, and who had procured him, through his connections, from the Arabian deserts. He is one of those few horses, on the purity of the blood of which we can have a certain reliance. The form of this animal is said to have exhibited every point desirable in a turf horse. The general characteristics of the racer are the Arabian head, the curving and tapering neck, the slanting, lengthened shoulders, the fully-developed muscular quarters, the bending hinder legs, the flat limbs, somewhat short downward from the knee, and the long and springing pastern. The Darley Arabian had these excellences, and was the sire of that wonderful racer, Flying Childers. If a judgment might be formed as to the original country of the horse, from the performances of the descendants of this animal, then the desert must have been the native soil of the general courser; but as we have already given our opinions upon this point, it need not again be touched upon here.

The great success of Mr. Darley with his imported stranger, turned the current of fashionable opinion, among English sportsmen, so much in favour of the horses of Arabia, that it became a common inducement to style all horses brought from the Levant, Arabians, whether or not they might have been really such, or Persians, Syrians, Egyptians, Turks, or Barbs. This has occasioned much confusion and uncertainty; but it has been experienced, that the horses of all these countries are, in certain degrees, endowed with the properties of the race-horse, and the blood of our English thorough-bred horse is derived from a mixture of all those, although doubtless that of the Arabian and Barb predominates.

THE GODOLPHIN ARABIAN.

The Godolphin was imported into this country about five-and-twenty years after the Darley Arabian. Both of these horses were the most celebrated and valuable for their blood and high form, which have yet appeared. There are sufficient reasons, however, for the supposition that Lord Godolphin's horse was in reality a Barb.

The portrait of the Godolphin Arabian, by the artist Stubbs, gave rise to some unfavourable criticisms by his brethren of the pencil, in respect to the elevation of this horse's crest, which was said to be excessive, indeed totally out of nature. It was therefore asserted

that the painter had drawn on his imagination, in order to adorn a horse with such a lofty and swelling forehand. But, be this as it may, the Godolphin Arabian has been of the greatest importance in the improvement of the breed of the racing stud. At the present day, we have artists who seize with avidity the occasion of taking the portraits of celebrated horses, and it is not to be expected that any doubt of a likeness will take place in future, however great may be the winning horse of his time.

The fate of the Godolphin Arabian seems to have been as chequered as that of many other public characters; and he was as much indebted to accident for the development of his powers, as some of the higher breeds of the "lords of the Creation" have been. So little was he valued in France, that he was actually employed in the drudgery of drawing a cart in the streets of Paris. What an ignoble occupation for the blood of an Arab! A Mr. Coke brought him to England, and gave him to Williams, master of the St. James's Coffee-house, who made a present of him to the Earl of Godolphin. Though now elevated from the cart in the streets of Paris, to the stud of a British nobleman—whose name the Arabian afterwards bore—his merit was still unappreciated to the fulness of its extent; and it was not until he had produced a colt foal, the famous Lath, the most elegant and beautiful as well as the best racer of his time, that he was now treated "according to his deserts." He then became, even in a higher degree than the Darley, one of the progenitors of our thorough-bred horses.

The Godolphin was fifteen hands in height, of great substance, of the truest conformation for strength and action, bearing every indication of a real courser. His colour was entire brown bay, with mottles on the buttocks and crest, excepting a small streak of white upon the hinder heels. He was imported into France from some capital or royal stud in Barbary, whence it was suspected he was stolen. He was foaled in 1724 and died in 1753.

THE WELLESLEY ARABIAN.

We introduce this horse because he has been considered, although erroneously, the finest specimen of a superior Arabian. He bore a considerable resemblance to the larger war-horse of Europe, possessing the delicate skin, and various other attributes of the south-eastern courser. But it is with reason supposed that he was the produce rather of some country bordering on the land of deserts, than in Arabia itself. In England, the Arabian or Barbary horse, in process of time, acquires an increase of size, and fulness of form, together with a considerable expansion of the hoofs. This is, no doubt, the effect of lower and more moist grounds, and more succulent food than can be found in the deserts. There the dryness and purity of the air and soil compress the animal body, impart a superior firmness and elasticity to the tendinous and fibrous system, allowing greater powers in a smaller compass of substance, and exalting the tone and vigour of the animal spirits. For these reasons horses are chosen from the deserts for their fleetness and courage, and from the mountainous regions for coursers. A few of the offspring of the Wellesley Arabian were trained, but not with sufficient success to raise his reputation as a covering animal. This is the last Arabian, or foreign horse trained from, in this country.

THE DEVONSHIRE, OR FLYING CHILDERS.

Childers, a bay horse, somewhat upwards of fifteen hands in height, was foaled in 1715, and was the property of Leonard Childers, Esq., of Carr House, near Doncaster, and sold, when young, to the Duke of Devonshire. He was the immediate descendant of the Darley Arabian; and his history, as a racer, is so well known, and has been so often repeated, that a few items of it will here suffice. It is said that he was first used as a hunter, and that in the field, both his high qualities and his headstrong, if not vicious disposition, were discovered. He was, however, void of any taint of restiveness. It is probable that, like Eclipse, he did not start on the course until five, perhaps not until six years old, when he beat all the horses of his time, at whatever distance. He was never tried in running a single mile; but since his time, the measured and attested performances of far inferior horses, leave not the shadow of a doubt of his ability to run a mile within one minute of time! A horse called Firetail, ran, in 1772, a mile in

sixty-four seconds. Carrying nine stone two pounds, he ran over the Round Course, at Newmarket, three miles, six furlongs, ninety-three yards, in six minutes and forty seconds, when he was judged to move eighty-two feet and a-half in one second of time. He likewise ran over the Beacon Course, four miles, one furlong, one hundred and thirty-eight yards, in seven minutes, thirty seconds, covering at every bound a space of twenty-five feet. He made a spring or leap of ten yards, upon level ground, with his rider on his back. These are a few of the celebrated feats of this famous horse, which, in 1741, died at the age of twenty-six.

BLEEDING CHILDERS.

Bleeding Childers, so called from his frequent bleedings at the nose, afterwards called Young Childers, and finally Bartlett's Childers, was full brother to Flying Childers. He was never trained; but proved a very superior stallion. The Hampton-court Childers, sire of Blacklegs, was son of the Devonshire Childers. There were, in all, six nearly contemporary racers and stallions of the name of Childers.

KING HEROD.

King Herod, descended by his dam from Flying Childers, was of the highest reputation as a racer; whilst, as a stallion, he stands among the first, if he be not really the very first, in modern times. He has been ranked higher than Eclipse in this respect; some of his stock having been not only among the most speedy, but the generality of them the stoutest and best constitutioned horses the turf, at any period, has produced. He was a bay, about fifteen hands three inches high, and foaled in 1758. He was got by Tartar, out of Cypron. There was another Tartar, got by Blaze; but Tartar, the sire of King Herod, was got by Croft's Partner—one of our most famous racers—out of Meliora, by Fox. Partner, grandsire of King Herod, was foaled in 1718. He was a chestnut horse, of great power, exquisite symmetry and beauty, and immediately succeeded Flying Childers, as the best animal at Newmarket, giving weight to, and beating horses of the highest repute, over the course. He was got by Jig—no pedigree of dam—son of the famous Byerley Turk, and shows a pedigree through a list of highly reputed progenitors, concluding with the well-known Old Vintner Mare. Partner died in 1747, aged twenty-nine. Cypron, King Herod's dam, was got by Blaze, a son of Flying Childers, out of Sir William St. Quintin's Selima, got by the Bethell Arabian, and boasting in her lineage, Champion, the Darley Arabian, and Old Merlin. King Herod's pedigree consists of the oldest and purest blood.

Whilst speaking of the pedigrees of horses, however, we may here observe, with Admiral Rous, that "nothing can be more unsatisfactory than the pedigrees of English race-horses up to 1750. Although Charles II. and Queen Anne kept magnificent studs, and agents were employed by the masters of the horse of several successive sovereigns, to purchase valuable Eastern blood, no records were kept, and we are in ignorance respecting the breed of the royal mares. It was not until 1791, that Mr. Weatherly, the keeper of the Match-Book, obtained a list of pedigrees collected by a private gentleman. A register was then kept, and the *Stud-Book* was published in 1808. Since that time a regular account has been kept of the produce of thorough-bred stock; but many proprietors of brood mares will not take the trouble to register their foals. . . . The original intention of the compiler of the *Stud-Book*, was to register all the winners in the official *Racing Calendar;* but a cloud hangs over the book, threatening a formidable class of rivals to dispute the value of the orthodoxy of the pure breed. . . . Although it is an axiom in breeding animals, from man downwards, that a fresh cross of good blood is most desirable, we have failed to have made any improvement in our race-horses by importation of any Eastern blood during the present century, simply owing to the extraordinary superiority which our horses have obtained in point of strength, size, and speed, over the original stock."

Herod, like Childers and Eclipse, did not start upon the course until five years old. He never ran anywhere but at Newmarket, Ascot Heath, and York, and always over the course, or four miles; stoutness or game, and ability to carry weight, being his play. He ran five times for a thousand guineas each race, and won three of them. The last race

he won was against Ascham—a curious one, from the circumstance of two aged horses carrying feathers, five stone seven, and six stone. He won several matches for five hundred guineas, and a sweepstake of three hundred guineas, nine subscribers.

The fame of this racer as a stallion, in the *Turf Register*, is truly splendid. In nineteen years—namely, from 1771 to 1789—four hundred and ninety-seven of his sons and daughters won for their proprietors, in plates, matches, and sweepstakes, the sum of £201,505 9*s*., exclusive of some thousands won between 1774 and 1786. He was the sire of the celebrated Highflyer, bred by Sir Charles Bunbury, which was never beaten. Herod also got Woodpecker, Bourdeaux, Anvil, Hammer, Sting, Adamant, Plunder, Quicksand, Rantipole, Whipcord, and many others, among which were the speediest horses of their day. Tuberose, Guildford, and Latona, were rare examples of the family stoutness, and Laburnum was an excellent and useful racer. The list of brood mares got by Herod is very large.

King Herod first covered the property of Sir John Moore, Bart., at ten guineas. In 1774 his price rose to twenty-five, at which it remained till his death, in 1783, in the twenty-second year of his age.

This noble animal was so shamefully neglected in his latter days, and his body so encrusted with dung and filth, that, it is said, the immediate cause of his death was a mortification in his sheath. Many much later instances are known of covering stallions neglected in a similar way. George IV., when Prince of Wales, formerly allowed the breeders in the vicinity of his residence in Hants, the use of a well-bred stallion gratis, excepting the groom's fee of a crown: the consequence of which was the exhaustion of the animal. So many mares were sent, that it was impossible for nature to support the continued demand; and the result was the most wretched, puny, spindle-shanked produce to be imagined.

MARSK.

This horse was foaled in 1750, and so named from the place where he was bred, being the property of John Hutton, Esq., of Marsk, Yorkshire, who afterwards disposed of him to his royal highness, William, Duke of Cumberland. He was got by Squirt, son of Bartlett's Childers, out of the Ruby mare. She was from a daughter of Bay Bolton and Hutton's Black Legs—Fox Cub—Coneyskins—Hutton's Grey Barb—a daughter of the Byerley Turk, from a Bustler mare. This is one of our highest bred pedigrees, going back to the reign of Charles I. In the year 1750, the duke made an exchange of a chestnut Arabian with Mr. Hutton, for the colt, which his royal highness afterwards named Marsk.

In Mr. Hutton's *Stud-Book*, printed by Weatherby in 1801, appear the following extracts:—

"In the year 1750, his royal highness the Duke of Cumberland, gave me—John Hutton—a chestnut Arabian in exchange for a brown colt, got by Squirt, bred from the Ruby mare; and which his royal highness afterwards called Marsk.

"My Black Legs was got by the Mulco Bay Turk; his dame by Coneyskins; his granddam was the old Club-foot mare, got by Mr. Weekes's Hautboy."

"The above are true copies from Mr. Hutton's *Stud-Book*. E. GELDART.

"MARSK, *October*, 1801."

The history of Marsk, like the Godolphin Arabian, was highly eventful, and distinguished by alternate depression and elevation.

He was a capital racer, and beat Brilliant; but he was an uncertain horse. Being in low estimation as a stallion in the duke's stud, he was sold at his royal highness's sale, at Tattersall's, to a farmer for a trifling sum; and in 1766, as will be observed in the history of Eclipse, covered country mares and foresters, at half-a-guinea. When Mr. Wildman, the purchaser of Eclipse, found his intelligence respecting that colt correct, he thought it advisable to get into his possession his sire, and bought Marsk of the farmer for twenty pounds, who professed himself happy at being well rid of a bad bargain.

This animal has been styled the "prince of horses."

It is sufficient to say that, besides so many other racers of high reputation, he was the sire of Eclipse, Shark, Pretender, Honest Kitt, Masquerade, Leviathan, Salopian, and Pontac.

Shark won sixteen thousand and fifty-seven

guineas, in matches, sweepstakes, and plates; beating the best horses of his day, at their own play, whether for speed or stoutness.

Marsk seems to have had the caprices of fortune imparted to him as an inheritance from his sire. Squirt, after running with great repute, became a stallion in Sir Harry Harpier's stud, who esteeming him of no worth, ordered him to be shot. As the huntsman was leading him out of the dog-kennel, he was begged off by the stud-groom; and this poor, despised, death-doomed animal afterwards got Marsk, the sire of an immense number of excellent horses, whose united winnings are not now to be calculated. The immediate progeny of Marsk, however, realised to their owners upwards of seventy thousand pounds.

Marsk died in July, 1779, in his twenty-ninth year.

ECLIPSE.

Eclipse, fully master of sixteen stone, was bred by William, Duke of Cumberland, of Culloden memory, and foaled during the great eclipse in 1764, whence the name given him by the royal duke. He was got by Marsk, a grandson, through Squirt, of Bartlett's Childers —to be noticed further on—out of Spilletta. Spilletta was got by Regulus, son of the Godolphin Arabian, out of Mother Western, which mare was got by a son of Snake, full brother to William's Squirrel, her dam by Old Montague, grandam by Hautboy, out of a daughter of Brimmer—her pedigree not preserved. Such is the carefully chronicled evidence of the purity of our race-horses from Oriental blood.

The proportions of this animal, as given by Mr. St. Bell, the founder of the Veterinary College in St. Pancras, are as follows:—

The length of the head of the horse is supposed to be divided into twenty-two equal parts, which are the common measure for every part of the body.

Three heads and thirteen parts will give the height of the horse from the foretop to the ground.

Three heads, from the withers to the ground.

Three heads, from the rump to the ground.

Three heads and three parts, the whole length of the body, from the most prominent part of the chest to the extremity of the buttocks.

Two heads and twenty parts, the height of the body, through the middle of the centre of gravity.

Two heads and seven parts, the height of the highest part of the chest from the ground.

Two heads and five parts, the height of the perpendicular line which falls from the articulation of the arm with the shoulder directly to the hoof.

One head and twenty parts, the height of the perpendicular line which falls from the top of the fore-leg, dividing equally all its parts to the fetlock.

One head and nineteen parts, the height of the perpendicular line from the elbow to the ground.

One head and nineteen parts, the distance from the top of the withers to the stifle. The same measure also gives the distance from the top of the rump to the elbow

One-and-a-half head, the length of the neck from the withers to the top of the head. The same measure also gives the length of the neck from the top of the head to its insertion into the chest.

One head, the width of the neck at its union with the chest.

Twelve parts of a head, the width of the neck in its narrowest part.

The same measure gives the breadth of the head taken below the eyes.

One head and four parts, the thickness of the body from the middle of the back to the middle of the belly.

The same measure gives the breadth of the body.

Also the rump from its summit to the extremity of the buttocks.

Also the distance from the root of the tail to the stifle.

Also the length from the stifle to the hock.

Also the height from the extremity of the hoof to the hock.

Twenty parts of a head, the distance from the extremity of the buttocks to the stifle.

Also the breadth of the rump or croup.

Ten parts of a head, the breadth of the fore-legs from their anterior part to the elbow.

Ten parts of a head, the breadth of one of the hind-legs taken beneath the fold of the buttocks.

Eight parts of a head, the breadth of the ham taken from the bend.

Also the breadth of the head above the nostrils.

Seven parts of a head, the distance of the eyes from one great angle to the other.

Also the distance between the fore-legs.

Five parts of a head, the thickness of the knees.

Also the breadth of the fore-legs above the knees.

Also the thickness of the hams.

Four parts of a head, the breadth of the pastern, or fetlock joint.

Also the thickness of the coronet.

Four-and-a-half parts of the head, the breadth of the coronet.

Three parts of a head, the thickness of the legs at their narrowest part.

Also the breadth of the hinder-legs, or shanks.

Two-and-three-quarter parts of a head, the thickness of the hind pasterns.

Also the breadth of the shanks of the fore-legs.

Two-and-a-quarter parts of a head, the thickness of the fore pasterns.

Also the breadth of the hind pasterns.

One-and-three-quarter parts of a head, the thickness of the fore and hind shanks.

Such are the proportions of this famous horse, which in form, constitution, and action, seemed to comprehend every excellence for the course. When a yearling, he was purchased by Mr. Wildman, a sporting sheep salesman of Smithfield, for seventy-five guineas, on the decease of the Duke of Cumberland, at the sale by auction of his royal highness's stud. Marsk, the reputed sire of Eclipse, subsequently, on the New Forest, covered country and forest mares at half-a-guinea each. But, after the transcendant qualities of Eclipse were established, the same Marsk covered at one hundred guineas a mare, and was advertised in succeeding seasons by Lord Abingdon, his proprietor, at two hundred or three hundred guineas a mare. Wildman had a friend in the old duke's stud, from whom he obtained a hint of the superior form of the Eclipse colt; but making the journey in haste, he did not arrive until the sale had commenced, and his object had been already knocked down at seventy guineas. Appealing instantly to his watch, which he knew to be a correct time-piece, he found the hour had not arrived by several minutes at which the commencement of the sale had been publicly advertised, and thence firmly insisted there had been no lawful sale, and that the lots knocked down should be put up again. The knight of the hammer, well aware of the resolution and pecuniary weight of Mr. Wildman, very prudently offered him the chance of any lot he should choose. Eclipse was put up again, and Wildman purchased the yearling at an advance of five guineas.

Immediately previous to Eclipse running for the King's Plate, at Winchester, in 1769, Colonel O'Kelly purchased the half share of him for six hundred and fifty guineas; and, afterwards, the remaining share for eleven hundred guineas.

Eclipse, for what reason has never been published, did not appear upon the turf until he was full five years old, when he was entered at Epsom for the Maiden Plate of fifty pounds. There can be no doubt that his trials at Epsom had been watched, as the odds at starting were four to one in his favour.

O'Kelly was, doubtless, well aware of the qualities of his maiden horse, by the large sums he then betted at such considerable odds. In running the second winning-heat, the whole five horses were close together, at the three-mile post, when some of the jockeys used their whips. Eclipse was quietly jogging on at a moderate rate; when, alarmed by the crack of the whips, he bounded away; and, notwithstanding his jockey held him back with all his strength, not one of his competitors could save his distance.

In running over the course at York, in the following year, for the Subscription Purse against Tortoise and Bellario, two first-rate racers, but aged, Eclipse took the lead; and the jockey, being unable to hold him, he was more than a distance before his competitors at the end of two miles, and won the race with the utmost ease. At starting, bets of twenty, and in running, one hundred pounds to a guinea were offered on Eclipse. On a certain race, O'Kelly bet five and six to four that he posted the horses—that is to say, named, before starting, the order in which they would come in. When called on to declare, he named—"Eclipse first, the rest in NO place;" and won his money—Eclipse distancing all the rest. Being distanced, they were, consequently, in a sporting sense, in no place.

Eleven King's plates, the weight carried for all of them being twelve stone (one excepted, ten stone), were won by Eclipse. In twenty-three years, three hundred and forty-four winners, the true progeny of this matchless courser, produced, to their owners, the sum of £158,071 12*s.*, various prizes not included.

About the year 1779, a noble duke, or some sporting member of his family, demanded of O'Kelly how much he would take for Eclipse? The reply was—"By the Mass, my lord, and it is not all Bedford Level that would purchase him." We state, on the authority of the keeper of a sporting coffee-house, frequented by Colonel O'Kelly, that this gentleman asked the sum of twenty-five thousand pounds down,

an annuity of five hundred pounds on his own life, and the annual privilege of sending six mares to the horse, as the price for Eclipse. O'Kelly affirmed, that he had acquired upwards of twenty-five thousand pounds by Eclipse.

Of the speed of this animal too much cannot be said; but we have no rule by which to judge of his stoutness or game, since no cotemporary racer was able to run for a moment by his side, far less able to try his power of continuance. If it be said, that he contended with middling horses only, the two or three capital ones that met him, having passed their prime, it must be remembered that those horses he distanced, and probably could have doubly distanced. The jockeys rarely if ever held him. The horse was always allowed to run according to his own will, yet he never swerved from his course, and, at the ending post, pulled up easily enough. O'Kelly, his proprietor, was yet apprehensive that he might, at some time, break away; and when the horse run over the course at York, with twelve stone, which he was judged to have performed in eight minutes, a number of men were placed at the ending post, with the view of stopping him, in case the jockey should be unable to pull him up—a precaution which proved entirely needless. He never felt the whip or spur on any occasion.

The only cotemporary which was supposed to have any pretensions to contend with Eclipse, was Mr. Shaftoe's famous Goldfinder, by Snap, a beautiful and long-reached brown animal. He was never beaten, and would have met Eclipse, to run for the King's plates, but he broke down previously.

The characteristics of the Eclipse racers were speed and size; and many of them bent their knees, and took up their feet in the gallop, with extraordinary activity. If few of them were stout, still fewer of them wanted steadiness; a restive or swerving horse being seldom found of that blood.

The eye of Turf science is directed, in the portrait of Eclipse, to the curve in the setting-on of his head, to his short fore-quarter, to the slant, extent, and substance of his shoulder, the length of his waist, and the breadth of his loins; to the extent of his quarters, and the length and substance of his thighs and fore-arms. Although a strong, he was a thick-winded horse; and, in a sweat or under severe exercise, was heard to blow at a considerable distance.

Eclipse first covered at fifty guineas; afterwards at twenty, being stinted to fifty mares, exclusive of those of his owner; ultimately at thirty guineas. In his progeny are ranked no fewer than three hundred and thirty-four winners.

In 1788, his feet having been neglected, he was removed from Epsom to Cannons, in a four-wheeled carriage, drawn by two horses, his groom being an inside passenger with him. The old racer and his attendant took their necessary refreshments on the road together. This splendid quadruped died at Cannons in the following year, on February 28th, aged twenty-five years; and, according to the precedent of the Godolphin Arabian, cakes and ale were given at his funeral. His heart weighed thirteen pounds; and his skull was extremely large. It was shown to Dr. Spurzheim, one of the celebrated founders of phrenology, who thus remarked upon the powers of the animal, judging from the craniological development:—

"The leading characteristics of Eclipse," he said, "were a remarkably large brain, not only in proportion to the size of the animal, but to horses in general; indicating great and high courage, unusual sagacity, but deficient in meekness, or rather possessed of a vicious temper." He further remarked that considerable difficulty must have been experienced in rendering such an animal subservient to his rider; but that, when subdued, he could be best governed by gentle treatment, and would prove docile under proper authority. The professor's observations have been esteemed remarkably correct.

There was an uncertainty in Eclipse's pedigree, arising from the circumstance of his dam having been barren in the previous year, and, in the next, covered by both Shakespeare and Marsk, and not coming to Shakespeare's, but to Marsk's time. A strong resemblance, however, existed in Eclipse, to the progeny of Shakespeare, in the particulars of colour, temper, and certain peculiarities of form.

Mr. John Lawrence, who was well acquainted with this animal, says—"Never, to the eye of a sportsman, was there a truer-formed galloper in every part; and his countenance and figure, as he stood in his box, notwithstanding his

great size, suggested the idea of the wild horse of the desert. His resolute and choleric temper was well known; and although he held a very familiar and dumb converse with us over the bar, we did not deem it prudent to trust ourselves alone with him in his apartment. He was nevertheless very kind and friendly with his groom."

In observing on the general character of the running of this animal, we cannot but remark that it was impossible to make a tool of him, even had it been desired, or had his owner intended to do so. He was no horse that could win a race to-day, and be beaten on the morrow by another horse of inferior powers. He seemed to have made up his mind to be always a winner, and resisted all the attempts of his jockeys to force him to accommodate his pace to that of his opponents. He took the lead, and gallantly maintained it, in spite of all opposition. Were there more horses of the temper of Eclipse, there would be less *finesse* practised on the race-course of the present day.

In closing the history of this animal, we must quote a few more extended observations of Mr. St. Bell, on some of his proportions. The *Essay* of that gentleman is replete with sound and practical information, expressed in clear and intelligible language; and is worthy of the perusal of all those that take an interest in such things as have a tendency to enhance the strength, beauty, speed, and splendour of the horse.

"The difference which results from peculiar conformation," says Mr. St. Bell, "militates, in some respects, against the rules laid down in the geometrical table in use in the veterinary schools on the continent of Europe, and proves that no common standard of measurement can apply generally to different species. As each species, and even each individual, has its own peculiar beauty, we cannot pretend to establish any general rule of beauty for the horse. Were a man to collect the various beauties of individuals, it might, indeed, serve as a model for the painter, or the statuary, but would be of no use to direct him in the choice of a horse. Eclipse was never esteemed handsome; but in *making*, he was nearly perfect, and speedy in proportion.

"We may propose that the legs of Eclipse, in their flexion in the gallop, described each a circle of three hundred and sixty degrees; and, consequently, the extent of the action of each leg was the same in extension. To this may be added the force of action, without which a horse cannot even walk. This muscular, and merely mechanical force, can only be computed by experiment; and well organised as Eclipse was, as to his muscles and the length and direction of his legs, we may venture to assert that, free of all weight, and galloping at full speed, he could cover an extent of twenty-five feet at each complete action of the gallop; that he could repeat this twice and one-third in each second; consequently that, doing his utmost, he could run nearly four miles in six minutes and two seconds.

"The excellence of the make of Eclipse may fairly be inferred from his superior speed; for this speed could result only from a harmonious combination in the organs of progression. Let us now suppose these same organs defective in their proportion, and inquire what would be the consequence.

"The Croup and Rump.—An examination of the bones of the ilium, confirmed me in my opinion, held during life, that the croup in Eclipse was disproportionately large. The extent of the *os pubis* and *ischium* caused him to go too wide behind. His hind-feet, instead of being parallel with his fore-feet, stood outward. This defect, which caused a wavering in the croup, in his gallop, together with other small defects, was overruled by his great muscular powers. A much greater fault in a racer is, when the croup is too narrow, and the muscles, which communicate with the loins and extremities, thin, and, consequently, weak.

"The Shoulder and Arm.—In Eclipse, the shoulder was too much loaded; but if too spare, the muscles will be weak, and the motions of the shoulder confined. The proportion of the arm is commonly determined by that of the shoulder-blade. These two parts, forming together the sides of an angle, more or less open, give to the muscles which move them, a quicker or less power, in proportion as this motion is made further from, or nearer to, the axis of the motion.

"The Hind Leg—the Thigh.—Eclipse was remarkable for length in his hinder parts.

The thigh, with the os-ilium, formed a considerable angle, whence followed a great extent of motion. The length of the tibia gave beautiful proportion to the leg; and the hock, from its size, and perfect make, must have produced the greatest possible degree of extension. The leg, pastern, coronet, and foot, fully corresponded."

In order to see at a glance the dimensions of Eclipse, we make the following extract from the same authority:—

HEIGHT AND LENGTH OF ECLIPSE.

	Inches.
Height from the withers to the ground	66
Height from the top of the rump to the ground	67
Length of the body, taken from the most prominent part of the breast to the extremity of the buttocks	69

LENGTH OF THE BONES OF THE LEGS.

Fore-Legs.	
Shoulder-blade	18
Humerus, or arm	12
Cubitus	16
Canon shank	22
Pastern, coronet, and hoof	8
Hind-Legs.	
Os-ilium	12
Femur, or thigh	15
Tibia	12
Shank or leg	14
Pastern, coronet, and hoof	9

The skeleton of this splendid animal, after passing through various hands, is now kept in the New Veterinary College, at Edinburgh, for which it was purchased for one hundred guineas from Mr. Bracy Clark, by Professor Gamgee.

BAY MALTON.

This horse was the property of the Marquis of Rockingham, and ran the four mile course at York, in seven minutes and forty-three seconds, a feat which had never been accomplished before in so short a time, by seven seconds. He combined great speed with considerable stoutness.

One of the severest plate-races on record, was run at Carlisle, in 1761, and in which there were no fewer than six heats, and two of them were dead heats, each of which was contested by the winner of the plate. The winning horse, therefore, ran twenty-four miles, and yet did not break down.

In 1763, at Salisbury, and over a four mile course, there were four heats between two horses—the Duke of Grafton's Havannah, and Mr. Wildman's Pam. Yet there was no breaking down.

One or two more instances of the combined speed and stoutness of former racers, are worthy of being placed on record.

In October 1741, at the Curragh meeting, in Ireland, Mr. Wilde engaged to ride one hundred and twenty-seven miles in nine hours. He performed it in six hours and twenty-one minutes, and employed ten horses. Allowing, therefore, for mounting and dismounting, and a moment for refreshment, he rode for six hours, at the rate of twenty miles an hour.

In 1745, Mr. Thornhill exceeded this, for he rode from Stilton to London, two hundred and thirteen miles, in eleven hours and thirty-four minutes; which is, after allowing the least possible time for changing horses, twenty miles an hour for eleven hours, and on the uneven ground of the turnpike-road.

In 1762, Mr. Shaftoe, with ten horses, and five of them ridden twice, accomplished fifty miles and a quarter, in one hour and forty-nine minutes. In 1763, this gentleman won a more extraordinary match. He was to procure a person to ride one hundred miles a day, on any one horse each day, for twenty-nine days together, and to have any number of horses not exceeding twenty-nine. He accomplished it on fourteen; and on one day he rode one hundred and sixty miles, on account of the tiring of his first horse.

Mr. Hull's Quibbler, however, affords the most extraordinary instance on record, of the stoutness as well as speed of the race-horse. In December, 1786, he ran twenty-three miles round the flat of Newmarket, in fifty-seven minutes and ten seconds.

POT-8-OS.

This was one of the numerous progeny of Eclipse, and holds a foremost place in the racing ranks. He was a chestnut foaled in 1773, his dam being Sports-mistress. He was bred by the Earl of Abingdon. At the Newmarket first spring of 1788, his proprietor had intimated his intention of disposing of some of his horses, whilst Pot-8-os was engaged in a sweepstake of one hundred guineas each, eight

subscribers. As the horses were starting, Lord Grosvenor asked the Earl of Abingdon the price of Pot-8-os. "Fifteen hundred guineas," was the reply. "With the chance of the race?" "Oh, certainly!" The transaction was closed; and, in a few minutes after, Pot-8-os and the subscriptions were Lord Grosvenor's. This horse died at Herne Park, Newmarket, in 1800, aged twenty-seven. His progeny hold a place in our best pedigrees.

HIGHFLYER.

This is one of the most celebrated racers on record. He was never beaten, and never paid forfeit. He was a bay horse, descended from King Herod, and foaled in 1774. Sir Charles Bunbury bred and sold him to Viscount Bolingbroke, and he afterwards became the property of Mr. Richard Tattersall. He flourished between the years 1776-'80; witnessed the establishment of the St. Leger, the Derby, and the Oaks; and when he was christened, the statesman, Charles James Fox, was present at a festive meeting. Although he never started after five years old, his winnings amounted to upwards of nine thousand three hundred pounds, and his immediate descendants netted about one hundred and seventy thousand, four hundred pounds. He died at "Highflyer" Hall, Cambridgeshire, an elegant villa near Ely, the property of Mr. Tattersall, October 18th, 1793 aged nineteen years.

ESCAPE.

On the 20th of October, 1791, Chifney, the jockey of the Prince of Wales, afterwards George IV., rode the prince's famous horse Escape, by Highflyer, in a sweepstakes, from the Ditch-In, a distance of about two miles, against Skylark, Pipator, and Coriander; and the last won. On the following day Chifney rode Escape against the same horses over the Beacon course, a distance of four miles, and won. The betting on this race was four and five to one against Escape. Public rumour stated that the prince had gained a vast sum; but he gave a flat denial to his having won above four hundred pounds on the race; and having believed, as it was generally rumoured, that Chifney had ridden *booty*, a public investigation took place, and the whole resulted in the final retirement of his royal highness from the turf.

Escape beat the best horses in England, over the course of four miles, and was himself beaten on the same course, by middling horses. He beat Nimble, one of the speediest horses of his day, across the Flat, a distance of a mile and a quarter; and was beaten on the same course, in a private trial, by Don Quixote, and Lance—horses, we believe, of inferior speed to Nimble—several lengths before half the course was ran, and very easily, and a great way at the end; yet in another trial, two miles over Epsom, he beat Baronet and Pegasus, giving the former, a horse of his own year, and a winning racer, the enormous weight of twenty pounds. Baronet nevertheless beat him, at the same weight and distance, a few days after, at Ascot.

From a detailed account of the trials and public races of Escape, he clearly appears to have been a most uncertain runner. He seems to have possessed capital speed, and even great powers of continuance, when well to run; but to have been materially affected by the very slight and very usual mistakes in training; to have been subject to have the edge of his speed totally blunted by a few degrees of overwork; and his powers, both of speed and continuance, paralysed and rendered inert, by want of due exercise, or by errors in feeding, more particularly near the time of his running. There, also, most assuredly, is a perfect analogy of nervous sensibility, of irritability, and vacillation of fibre, between the human animal and the race-horse. As men differ, so do horses; and the warm-tempered, free, unequal, and nervous Escape, ought to have had for his trainer, his manager, and his jockey, such discriminating persons as could fully appreciate his temperament and disposition. Hard-headed and indiscriminating grooms of the common type, could have no real conception of the delicacy, vigilance, and care with which such an animal required to be treated.

As the failure of this horse led to the trial of Chifney, his rider, and the retirement of the Prince of Wales from the turf, this seems the proper place to give the opinions relative to the management of a race-horse, elicited from Chifney at his trial; and, although they are the sentiments of an uneducated, yet they are those of a practical man, and, on that account, deserving a place in this

work. We may premise that Chifney entered into the service of the running stables in 1770, and was regularly trained to his vocation, under the celebrated professors Fox and Prince. Riding, he says, "he learned himself. In 1773, I could ride a horse in a better manner in a race, to beat others, than any person ever known in my time. In 1775, I could train horses for running better than any person I ever yet saw." In 1784, he lived with Lord Grosvenor, riding his lordship's race-horses. He afterwards entered into the service of Thomas Panton, Esq., with whom he continued four years, until his engagement in the service of the prince. During his continuance with Mr. Panton, he rode most of the Duke of Bedford's race-horses; and tells us, he was assured by Mr. Panton, that "the Duke of Bedford was always highly pleased with his riding, as he always rode to a T, as his grace told him." His grace is well known to have been very precise in his directions to his jockeys; and appears to have been so well satisfied with Chifney, that, in all probability, had not his grace then meditated a total retirement from the turf, he would have engaged him for life. Immediately on quitting the service of Mr. Panton, he was engaged by his royal highness the prince, at a salary of two hundred pounds per year.

"I have said," observes Chifney, "that horses change in their twice running. If a horse is in perfect fitness for running, he immediately becomes exhausted, little or much. He must then change in his running. A horse cannot keep his perfect fitness for running more than one race till rested. I have seen *one sweat* between a horse's twice running, change him for the worse, astonishingly. It is destruction to horses to sweat them in the manner they are sweated at Newmarket, as the practice there is to sweat them once in six days—sometimes oftener; and between these days of sweating, it is usual for the horse to go out twice a day, each time having strong exercise. In these sweating-days the horses are mostly covered with cloths, two or three times doubled, and go in their sweats six miles, more or less, and, at times, go tolerably fast. Directly the horse pulls up, he is hurried into the stable, which is on the spot for that purpose. As soon as he gets in, there is often more clothes thrown upon him, in addition to those he had been sweated in. This is done to make the horse sweat the more; and he stands thus for a time panting, before he is stripped for scraping; and with being thus worked, clothed, and stoved, he is, at times, so affected, that he keeps breaking out into fresh sweats, which pour from him, when scraping, as if water had been thrown on him. Nature cannot bear this. *The horses must dwindle.*

"Now I think, in the first place, that the horse has been too long at this sort of work for his sinews; then the clothing and stoving him force his juices from him in such quantities, that his *spirit*, *strength*, and *speed must be destroyed;* and much clothing jades horses. A horse don't meet with this destruction when he runs, for then he is likely to be lighter in his carcase, lighter in his feet, having plates on, not shoes, which are wonderfully in favour of his sinews; and he is without clothes, and not stoved, and his course in running is very seldom more than four miles; therefore, this difference between sweating and running is immense.

"When a horse pulls up from his running, he has time given him to move gently in the air, and is usually scraped out upon the turf, and by these means he perspires no more than suits his nature.

"Horses should have different brakes, against weather, to scrape in. Buildings for this, I think, would be most properly made after the horse-dealer's rides in London; open in front, being out of the weather, and not out of the air. Places of this sort would be much the best for horses to saddle in; for saddling in close, dark stables, makes them, at times, break out with great perspiration when under that operation. Besides, in fine roomy places of this sort, there would be proper space, &c., for noblemen and gentlemen sportsmen to command a sight of the horses at saddling; and horses are less timid, when in a crowd, than they are when not in it, yet hear it.

"When a horse is first taken into work, after having had a long rest, his carcase is then large and heavy; and the practice is to put more clothes upon him, and order him to go a longer sweat. But the horse, in this stage of his training, is the less able to bear more

clothes, and go further in his sweats; for, he himself being heavy, has, with boy and clothes, at times a great weight upon his legs. Therefore, what with this pressure, and his work heating him, it makes his sinews full and weak; and thus working a little too fast, or too long, upon his sinews at one stretch, they are forced out of their places. This once done, the horse seldom stands training after.

"It is ignorant cruelty that causes a number of horses to be unskilfully lamed at Newmarket; when gentlemen not only lose the use of the animals and their money, but they are deprived of the sport they otherwise might have.

"The principal care in training horses for running, and hunters and hacks for hard riding, is, to train the legs to be able to carry the carcase. To do this they should first be used to short exercise, short gallops, short sweats, and time given between their work for their sinews to rest, or the best of legs will become destroyed.

"The legs of horses are very soon destroyed at first coming into work; but when they have had time to be well trained, scarcely any running or riding will hurt them.

"Some few, I am informed, have a way of *pinching their race-horses in their meat and water. This is another certain way of perishing a horse in his spirit and strength.* Where a horse is too large in his carcase, he should be well fed, as horses are, I believe, for the most part, at Newmarket; and, instead of pinching him in his water, where *a horse is greedy of it, he should be watered very often*, and, at all times, as much as he will drink given to him. He will then drink less, and come straight and strong in his carcase.

"The outcry is, Why are there so few good runners, or that the turf-horses degenerate? Some say they think it is from running horses too young. My opinion is, *that the best running mares are trained till their running is gone from them little or much; then they are turned into the stud, exhausted of their juices.* Perhaps they drop a foal in the following year, and so on, year after year, suckling one foal while breeding another. The mare thus turned into the stud, is drained of her strength; and being kept continually breeding, without she lays herself barren a year or two by her mis-standing to the horse, she will remain bereft of her strength. But the chance manner of her being allowed to lay herself fallow, gives her an opportunity of recovering her juices or strength, to enable her to breed a stronger foal, provided the horse that is put to her, is in the same proper state. As it is with the mares, so is it with the horses. They are turned out of training into the stud, drained of their nature; and the better runners they are, the more are they pressed with mares, and in such numbers as to exhaust their prolific powers.

"These are my reasons why the turf-horses degenerate in length, speed, and beauty."

Lord Coleraine was confederate on the turf with his friend, Mr. Robert Pigott, when his celebrated horse, Shark, was at his best; Mr. Pigott trusted the whole management of his stables to him. He says—

"I do not believe there ever was a better horse than Mr. Robert Pigott's Shark, excepting Eclipse, which was a very uncommon horse. I will tell you what Shark could do, by which you may give a tolerably good guess whether you have nearly the best horse of his year. Run five or six of your young colts together, one mile: if they all come in well together, you may be sure that not one of them is worthy to be kept in training, excepting you have one amongst them which is an uncommonly large-sized colt, large-limbed, and loose made. It is possible that, when he comes to his strength, and fills up, he may turn out a good horse. If you have one colt which, in the trial, runs clear away from all the rest, you may expect that he will turn out a good runner. Take him, about a fortnight after, run him with two of the others which were the two first of those beaten; for you must not run him with the worst or last of the lot. Let him give them both twenty-one pounds. If he does not beat them cleverly, you have no right to expect that he is the best, or nearly the best, horse of his year. I will mention a wonderful trial, when Shark was coming six years old. He ran from the Ditch-In. I borrowed a mare, a good runner, of Mr. Vernon. I think her name was Atalanta, but I cannot mention her name for certain. I gave Mr. Vernon fifty guineas for the hire of her; but then I agreed to have her

for a fortnight before the race, in our stables, that he should not run her to death, by which I might have been deceived in the trial. I promised him to run her only once, from the Ditch-In, and, on the third day, again one mile only, and then to return her. John Oakley rode Shark, and Anthony Wheatly rode the trial mare. Shark gave all the other horses, except the mare, twenty-one pounds. There were three others—my horse St. George, Salopian, and Jack of Hicton. The mare carried four pounds more than them; consequently Shark gave her only seventeen pounds. As the mare and the rest of the horses were coming down the small declivity just past the Furzes on the town side, Shark had beaten them full three hundred yards; so much so, that I rode up to Oakley and told him to pull Shark up, and go in, in the centre of the group. St. George and the mare had a very severe race; he just won it; the other two were beaten three or four lengths.

"St. George had been turned out in a paddock, at my own house, in Berkshire, for ten months, and well fed with corn the whole time. Before I turned him out, I ran him with Salopian, across the Flat, and Salopian beat him shamefully.

"Remember, every horse, including the mare, was of the same age—six years old. Twenty-one pounds is the test of speed; and this your colt must be able to give to one which is a tolerable good runner, and not to one which cannot run at all, or you have not the best, or nearly the best colt of the year.—So much for racing."

After recounting the achievements of some of these old racers, the author of *The Horse* asks, "What are our racers now?" and answers, "They are speedier, longer, lighter, but still muscular, although shorn of much of their pride in this respect." He continues—"They are as beautiful creatures as the eye would wish to gaze on; but the greater part of them give-in before half the race is run: and out of a field of fifteen, or even twenty, not more than two or three of them will live, in the exertion of their best energies, far within the ropes. And what becomes of them when the struggle is over? After the severe racing, as it is now called, of former times, the horse came again to the starting-post with not a single power impaired; and, year after year, he was ready to meet any and every rival. A single race, however, like that of the Derby, now occasionally disables the winner from ever running again; *yet the distance is only a mile and a-half.* The St. Leger is more destructive to the winner, although the distance is less than two miles. The race of the day has been run; some heavy stakes have been won by the owner; the animal by whose exertions they were gained is led away, and it is sometimes an even chance whether he is ever heard of, or, perhaps, thought of, again. He has answered the purpose for which he was bred, and he has passed away."

By this quotation, it is evident that Mr. Youatt thinks, with Chifney, that the present character of racers has degenerated. Stoutness has been sacrificed to speed, and the horse has finished the object of his birth and training, when he has won a Derby. But what says the greatest existing authority on this very point.

"A very ridiculous notion exists," says Admiral H. J. Rous, "that because our ancestors were fond of matching their horses four, six, and eight miles, and their great prizes were never less than four miles for equal horses, that the English race-horses of 1700 had more powers of endurance, and were better adapted to run long distances, under heavy weights, than the horses of the present day; and there is another popular notion that our horses cannot now stay four miles.

"From 1600 to 1740, most of the matches at Newmarket were above four miles. The six-mile post, in my time, stood about two hundred yards from the present railroad station—Six-mile Bottom—and the eight-mile post was clear, south from the station on the rising ground; but the cruelty of the distances, and interest of horse-owners, shortened the course in corresponding ratio with the civilisation of the country. Two jades may run as fine a race for eight miles, as for half a mile; it is no proof of endurance. *You may match any animals for what distance you please, but it is no proof of great capacity.* We have no reason to suppose that the pure Arabian of the desert has degenerated—his pedigree is so well kept; his admirers in the

East are as numerous, and his value in that market has not been depreciated. In 1700, the first cross from these horses, were the heroes of the turf. Look at the portraits of Flying Childers, Lath, Regulus, and other celebrated horses, including the Godolphin Arabian. If the artists were correct in their delineations, they had no appearance of race-horses; they, of course, were good enough to gallop away from the miserable English garrans of that era, as a good Arab, or Barbary horse, like Vengeance, would run away from a common hackney in the present day. Amongst the blind, a one-eyed man is a king.

"My belief is, that the present English race-horse is as much superior to the race-horse of 1750, as he excelled the first cross from Arabs and Barbs, with English mares; and again, as they surpassed the old English racing hack of 1650.

"The form of Flying Childers might win now a £30 plate, winner to be sold for £40; High-flyer and Eclipse might pull through in a £50 plate, winner to be sold for £200. This may be a strong opinion; it is founded on the faith that, whereas one hundred and fifty years ago, the Eastern horses, in their first cross, were the best and fastest in England; at this day, a second-class race-horse can give five stone to the best Arabian or Barb, and beat him from one to twenty miles. I presume, therefore, that the superiority of the English horse has improved in that ratio above the original stock."

The majority of the plates run for during the last century were given to six-year-old horses, carrying twelve stone four miles, from an impression that a horse should not be trained to run a distance under that age. Before 1770, plates, weight for age, were of rare occurrence. At the commencement of the present century, the inauguration of three and four-mile heats, with ten stone four pounds, to eleven stone six pounds, formed the conditions upon which the royal plates were usually contested. The system of short races, and light weights, was introduced by Sir Charles Bunbury, and the conditions of the royal plates were gradually altered to suit the new style of racing.

However strong may be the conviction, in the minds of some admirers of the horse, that the modern racer is degenerating, there are many facts which might be adduced to prove the contrary. As to the matter of stoutness, we think, from all we can learn, there can be no question, notwithstanding the opinion of Admiral Rous. Yet neither Flying Childers nor Eclipse kept the turf for more than two seasons; and we have Catherina running one hundred and seventy-one races, and winning seventy-six times; we have Fisherman running one hundred and twenty races, and winning sixty-nine; we have Euphrates running ninety-two; Isaac, ninety; Zohrab, ninety; and Potentate, eighty-seven. These figures are little indicative of that degree of degeneracy which some writers would endeavour to make us believe has taken place in the breed of our racers.

Having devoted a considerable space to the racers of the last century, we will now briefly record the performances of a few of the present; and passing over Fleur-de-lis, and some others, we may commence with the celebrated

BEESWING.

This horse was, in 1833, bred by Mr. W. Dede, of Nunnykirk, Northumberland. Her sire was Doctor Syntax, the winner of twenty-nine races out of forty-four starts. Her dam, by Ardrossan, out of Lady Eliza, by Whitworth, Sylvia, by young Marsh. Her blood is traceable up to the Darley Arabian. She made her public *debût* at Newcastle, in June 1835, for the Tyro stakes, but ran out when in a good place. In 1836 she ran for the great St. Ledger, which was won by Elis, the horse of Lord George Bentinck, who, on this occasion, had his animal conveyed in a van, the first time that this mode of conveyance was adopted among racing sportsmen. Beeswing ran eight seasons, starting sixty-four times, and winning fifty. She netted to her owner, seven thousand and eighty pounds.

ALICE HAWTHORN.

This fine animal was foaled in 1838, and bred by Mr. John Plummer. Her sire was Mully Moloch, the victor over some of the best horses of his day. In 1854, in his twenty-fourth year, he figures before the world as the sire of eighty-two winners, of whom Alice Hawthorn was the most famous. Her dam was Rebecca, by Lottery. Alice started sixty-nine times, and won fifty and a-half races,

netting, in all, seven thousand eight hundred and ninety-four pounds.

She subsequently fell to the stud; and, in 1857, produced Thormanby.

BEADSMAN.

This beautiful horse was the winner of the Derby in 1858, and was bred by Sir Joseph Hawley, baronet. He was got by Weatherbit, out of Mendicant. He was a black-brown horse, standing fifteen hands two and a-half inches high. He had a beautiful blood-like head, with a fine full eye; rather long ears, well set on; a bending neck gracefully joining to his head; great depth of girth, rather light in his back ribs, good loins and back, muscular quarters and thighs; large arms, rather small in the bone, but strong tendons. He very much resembled his dam, the winner of the Oaks in 1846.

GOVERNESS.

This mare was bred by Mr. Gratwicke, and got by Chatham out of a Laurel mare, the dam of Oxonian, Rhedycina (winner of the Oaks in 1850), Student, Instructress, &c. She was a fine strapping animal, standing rather more than sixteen hands and an inch; and a good even-coloured chestnut, without any white, except a blaze in her face; and, for so large a mare, had a good head; powerful and muscular all over, and possessed of a wonderful stride.

The Derbies of 1860, '61, '62, '63, '64, '65, and '66, were won successively by Thormanby, Kettledrum, Caractacus, Macaroni, Blair-Athol, Gladiateur, and Lord Lyon.

Such are a few of the racing celebrities we have chosen, to illustrate the running of the present century; and it now becomes a duty briefly to discuss the humanity of the question as to whether the modern system of racing short distances, is preferable to the old system of heats, and long distances. Morally, this is, perhaps, the most interesting portion of our subject, and demands the attention of every man possessed of such sentiments as are inculcated by the gradual development of civilisation.

In *Observations on Breeding for the Turf*, by Mr. N. H. Smith, we find this subject touched upon. "The style of racing now," observes that gentleman, "is totally different from that of former days. At present they run, except at country races, with light weights and short distances, where speed only can excel. Formerly they ran with high weights and long distances, where bottom or stoutness was equally necessary; and hence it may be presumed, that the horse possessing qualities which might have brought him into distinction then, would not be calculated to obtain now an equal fame at Newmarket. It is, therefore, very natural to suppose, that this difference in our style of racing, may, in a certain degree, have altered the character of our racing stock. By a reference to former sporting publications, it appears that the horses were then smaller—most likely shorter in the leg—and, no doubt, capable of carrying weights and *running in* better than the present racers, which most probably are, generally speaking, longer in the leg, with less substance. It must be allowed that the horse that can go a good distance the best with high weights, is, for all general purposes, and particularly for giving a value to any intermediate breed between the racer and draught-horse, the best sort of horse to resort to as a stallion; but there is something inhuman in the former practice of running four-mile heats with twelve stone weights, which must reduce the speed of the best horse in the world to a pace to which a race-horse ought never to be reduced. It is not racing, but a severe trial of constitutional strength, of the most distressing nature to the poor animal, and better calculated to gratify butchers and hawkers, than the tastes and feelings of gentlemen."

Independent of whatever cruelty might have been exemplified in the length of the former racing-course, there is yet another cruelty which, in the excitement of this sport, is apt to escape general notice. We allude to that which is inflicted by the jockey upon the sides of the animal he rides, by means of spur and whip, urging him on to the utmost of his speed, or rather beyond his utmost, when the animal is literally ready to drop. It ought to be considered an established maxim on the turf, that the efforts of a horse to win a race, are limited only by his physical powers. It is, we believe, generally admitted that the horse enters into the spirit of the race as thoroughly as does his rider; and, without whip or spur,

will generally exert his energies to the utmost to beat his opponent. It is beautiful to see him advancing to the starting-post, every motion evincing his eagerness. The signal is given, and he springs away; he settles himself in his stride; the jockey becomes a part and portion of him, every motion of the arms and body corresponding with, and assisting the action of the horse. On he goes, eager, yet husbanding his powers. At length, when he arrives at that distance from which the rider knows that he will *live home* at the top of his speed, the hint is given, and off he rushes. The race now in reality begins, and every nerve is strained to head his competitor. Then, too, comes the art of the rider, to keep the horse within his pace, and with admirable *give and take*, add to the length of every stride. Then, perhaps, the spur may be lightly and skilfully applied, to rouse every dormant energy.

A sluggish, lurching horse, may need more punishment than the humane observer would think justifiable; but the natural ardour of the race-horse, roused at the moment of the grand struggle, by the moderate application of the whip and spur, will bring him through, if he can win.

An anecdote of Forrester will afford sufficient illustration of the natural emulation of the racer. He had won many a hardly contested race; at length, over-weighted, and over-matched, the rally had commenced. His opponent had been waiting behind, but had now overtaken him, when, till within distance, they continued to be close together. It was a point that could scarcely be decided; but Forrester's strength was failing. He made one desperate plunge—seized his antagonist by the jaw to hold him back, and could be scarcely forced to quit his hold.

In like manner, a horse belonging to Mr. Quin, in 1753, finding his adversary gradually passing him, seized him by the leg, and both riders were obliged to dismount, in order to separate the animals.

With horses such as these, exhibiting the highest evidence of being thoroughly endued with the true emulative spirit, what need for a severe application of the whip or spur? Would the pain, which they by these instruments inflict, have carried such horses over one additional inch of ground? In all probability their lacerations would have been thrown away; they might have shortened the stroke for the animals which, perhaps, would have become enraged, and have suspended every exertion. What says an authority upon this subject.

"Those persons who insist upon an innate quality in what is termed 'blood,' are led to believe that there is something in the nature of a thorough-bred horse which enables him to struggle in a race far beyond his natural capabilities, and which is distinguished by the term 'game.' We do not think there is. We learn from experience, that horses often allow themselves to be beaten by others which are inferior to them, from sheer ill-temper; but their efforts to run a race, we consider to be merely limited by their physical powers, the effect of a proper arrangement of their parts; and that the operation of the mind, or spirit, has nothing at all to do with it. The hero at the Olympic games had, and the champion of the British boxing-ring may have, feelings which, from the superiority of their nature, and the fact of their character, interest, and future happiness being all involved in the event, might have induced them to struggle, even to the very verge of life; but the same sense of honour, and the same spirit of emulation, cannot, at least, in anything like the same ratio, be ascribed to the race-horse. *If his own acting powers be unequal to those of others opposed to him in the race, he yields to that superiority;* although it must be admitted, that what are called sluggish horses will not try to exert themselves to the utmost, unless urged to it by the spur and whip; and others, when spurred and whipped, slacken, instead of increasing their speed."

To this subject it is unnecessary to give further attention here: meanwhile, we may observe, that a diminutive brain is usually associated with dull senses; whilst a large one is generally possessed of much sensibility, sagacity, and courage; but, whatever may be these physiological distinctions or differences, let us always remember, that though

> "The gen'rous horse,
> Restrain'd and awed by man's inferior force,
> Does, to the rider's will, his rage submit,
> And answers to the spur and owns the bit;"

humanity towards him, as well as towards all

other animals, is one of our most imperative duties.

THE HUNTER.

Before entering on a particular description of the horse, to which this portion of our work is to be devoted, we shall enumerate the variety of horses which, under their different appellations, are characterised by more or less distinctive features. We have already described the racer; but the hunter, the hack, or hackney, the roadster, the lady's horse, or pad; the coach, cavalry, and dray horse, have yet to follow. In sporting language, the term horse indicates one uncut, or a stallion. Gelding has always been a common and familiar term. A horse below thirteen hands—four inches to a hand—in height, is styled a Pony; above that height, and below fourteen hands, a Galloway. The term *cob*, refers to a truss, short-legged nag, able to carry any weight. The *pack-horse* has long since disappeared from among us. The *cock-tail*, a new term in the slang of the inferior turf, indicates a racer not thorough-bred. The *welter* horse, is a term of long standing, but of unknown derivation. It points to either racer or hunter, master of the highest weight. The designation, *thorough-bred*, belongs to the racer of pure Arabian or Barb blood; and the term is likewise applicable to the horses of other nations of the south-east. A *nag*, in which the show of blood predominates, is called blood-like, or a blood-horse. The degrees of blood in an English horse are expressed by the terms, *half-bred*, *three-parts*, and *seven-eighths bred*. The first, or half-bred, is the produce of a racer and common mare, or *vice versâ*—the last cross not so frequent, nor deemed so successful; the second, of the racer and half-bred; and the third, of the racer, and the three-part bred mare. This last may, and has, sometimes, raced capitally. Several examples of successful seven-eighths bred racers, have occurred at various periods. Perhaps no instances have ever occurred, of a three-part bred horse saving his distance in runing two miles with thorough-bred racers.

The conventional form of the horse, as to the great essentials, may be held referable to every variety; for example, the head should be lean, *argutum caput*, neither long nor short, and set on with somewhat of a curve; the thropple loose and open; the neck not reversed—cock-throppled—but rather arched; the loins wide and substantial; this, more especially, if the back is long; the tail not drooping, but nearly on a level with the spine; the hinder quarters well spread, as a support to the loins, and as a security against the pasterns, in progression, being cut by the hoofs; the hinder legs should descend straight, laterally from the hocks, as a preventive to the defect styled *sickle-houghed*, or hammed; at the same time, the curve from the hock should be so placed, that the feet may come sufficiently forward to prop the loins, and that the horse may not be said to leave his legs behind him; the muscles of the thigh and fore-arm should be solid and full, though some horses are heavy and overdone by nature in those parts. The horse, of whatever description should not be *leggy;* and, of the extremes, short legs are preferable. The canon, or leg-bone, below the knee, should not be long, but of good substance; and the pasterns and feet, of a size to correspond with the dimensions of the horse; the hoof should be dark, the feet and frog tough, and the heel wide and open; the fore-feet should stand perfectly level, the toe pointing forward in a right line, otherwise the horse will knock, or "cut in the speed," however wide his chest; in plain terms, he will strike and wound either his pasterns, or his legs immediately below the knees, or both; the feet standing even, the horse being equal to his work, will seldom, perhaps never, knock or cut, however near the hoof may approach. A full, clear, azure eye, he also should have.

Such are the requisites of form, whether taken in their widest extremes for the racer or the cart-horse. For the hack, hunter, or racer, there are certain other requisites of form and quality. The principal of these are the deep, backward-declining, and, as it is called, the *counter*, or coulter shoulder, well elevated fore-hand, deep girthing-place, with sufficient racing blood to give lightness, action of body, and fineness to the hair and skin. This description applies with perfect aptitude to the hunter, which should have, moreover, great strength of loin and fillet, and should not be high upon the leg. Nor is any addition necessary for the running-horse, or racer, but

greater general length, which is the usual result of full or thorough blood. As to our coach-horses, such was wont to be the modern rage for speed, that even our mails and stages might have been said to consist, in a considerable degree, of racers and hunters; and our private coaches of hunting-like horses on a large scale.

In regard to the natural and peculiar form of the slow draught horse, he carries his substance in a round, full, and horizontal manner; his chest is widely developed; his shoulder rather round and bluff than deep, and its summit, the *apex*, or top of the fore-hand, not high and acute, but wide. Such a form seems best adapted to the collar, and to enable the animal to draw, or move forward, heavy weights; we, nevertheless, daily see numbers of first-rate draught horses with deep flat shoulders. It used to be held, that a low shoulder facilitated draught; and such was the form of the old Suffolk *sorrel* cart-horses, the truest and most forceful pullers of their kind. They were the only breed, collectively, that would draw *dead pulls;* that is to say, would continue repeated pulls, going down upon their knees to an immovable object—for example, a tree. This, draught horses in general, even the most powerful and the best, cannot be brought to do, whatever may be the severity used towards them; at the second or third pull, *gibbing*, as it is called, and turning their heads, as if to point with their eyes, towards their failing loins, is a common circumstance.

Such are the general characteristics of the lower grades of horses; and taking the middle of Charles the First's reign, as the date of the introduction of the Eastern animals into this country, it allows us about two centuries and a quarter for the manufacture of the English thorough-bred horse, in his form as he is found in Great Britain, and in Great Britain only. To preserve him in his purity, Arab and Persian mares were, also, imported at the same period, their produce then, as now, being considered and treated purely with reference to the turf, as their ultimate destination. The cross between the Arab stallions and the native mares, was held as the fittest for the field—strength, with a little breeding, enabling any kind of equine flesh on four legs, to canter from daylight to noon, alongside the long-eared, short-legged harrier, or beagle of that day.

The hunter is generally a horse between fifteen and sixteen hands in height, from the half-bred to the thorough-bred species; and ought to be of a lofty fore-hand, and shoulder well formed for action, with wide and substantial loins, moderately short legs and pasterns, and sound feet. The fashion of riding full-bred and speedy horses, so prevalent of late years, was equally prevalent in the beginning; indeed, was original in the system. But this chiefly takes place in light-soiled counties. Upon strong and heavy soils, a powerful, well-shaped, half-bred horse, may perform satisfactorily, and make a good figure; but upon light lands and downs, the speed of the high-bred courser is too much for his powers, and he cannot long hold his way in such superior company. On a general consideration, the three part or seven-eighth bred horse is best adapted for hunting—since, at the same time, acknowledging the superiority of the thorough-bred horse, it is so extremely difficult to obtain him of that make and form which shall sufficiently combine strength with speed, to fit him for his duties.

Hunting is obviously one of the most severe labours of the horse, yet one that is so generally attractive to him, that there are well-authenticated anecdotes of old hunters, inspired by the music of their fellow-sportsmen, the hounds, breaking pasture over the most dangerous fences, following the chase, and coming first in at the death.

Until he has attained his sixth year, the joints of a horse are not sufficiently fixed to carry him well through a season's hunting; although, at five, he should be cautiously and moderately used in the field. His education consists chiefly in being taught to leap the bar, standing, since generally all horses will take a flying leap, in some manner or other. The practice of furzing the leaping-bar around, is well known; but some grooms are too harsh and hasty with the young horse, whence many animals, of irritable tempers, can never afterwards be made staunch leapers. One of the most extraordinary leaps made by a horse was done at Birmingham, by an animal belonging to a Mr. Beardsworth. On the ground being

accurately measured by some gentleman who witnessed the performance, it was found that, in passing over a bar three feet six inches high, the leap was taken at the amazing distance of seventeen feet seven inches from it, and the whole space of ground covered was twenty-seven feet eight inches. The horse was fifteen hands and a-half high, and carried upwards of twelve stone. He was afterwards ridden over the same bar several times, and cleared upwards of eight yards without much apparent effort.

The first property of a good hunter is, that he should be light in hand. For this purpose, his head must be small; his neck thin, and especially thin beneath; his crest firm and arched, and his jaws wide. The head will then be well set on. It will form that angle with the neck, which gives a light and pleasant mouth.

The fore-hand should be loftier than that of the racer. A turf horse may be forgiven if his hind quarters rise an inch or two above his fore ones. His principal power is wanted from behind; and the very lowness of the fore-hand may throw more weight in front, and cause the whole machine to be more easily and speedily moved. A lofty fore-hand, therefore, is indispensable in the hunter; the shoulder should be as extensive as in the racer; also as oblique, and somewhat thicker; the saddle will then sit in its proper place, and will continue so, however long may be the run.

The barrel should be rounder, to give greater room for the heart and lungs to play, and send oxygenised blood in greater quantities to the larger frame of this kind of horse; room to play is all the more essential when the run continues unchecked for such a length of time as to begin to be distressing. A broad chest is an excellence in the hunter. In the violent and long-continued exertion of the chase, the respiration is exceedingly quickened, and a great deal more blood is hurried through the lungs in a given time, than when the animal is at rest. There must be sufficient room for this, or the beast will be blown, and possibly destroyed. The majority of the horses that perish in the field are narrow-chested.

The foot of the hunter is a most material point. It is of consequence in the racer; yet it is a notorious fact, that numbers of our best thorough-bred horses have had very indifferent feet. The narrow contracted foot is the curse of many of the racing blood. The work of the racer, however, is all performed on the turf, and his bad feet may scarcely incommode him; but the foot of the hunter is battered over many a flinty road and stony field; and if not particularly good, will soon be disabled and ruined.

The position of his feet, also, requires attention. They should, if possible, stand straight. If they turn a little outward there is no serious objection; but if they turn inward, his action cannot be safe, particularly when he is fatigued or over-weighted.

The body should be short and compact, compared with that of the race-horse, that he may not, in his gallop, take too extended a stride. This, in a long day, and with a heavy rider, would be a serious disadvantage, from the stress on the pasterns; and more serious when going over clayey ground, during the winter months. The compact, short-strided horse will almost skim the surface; while the feet of the longer-reached animal will sink deep, and he will wear himself out by efforts to disengage himself.

The hunter may be fairly ridden twice, or if not with any very hard days, thrice a week; but, after a thoroughly hard day, and evident distress, three or four days' rest should be allowed. They who are merciful to their horses, allow about thirty days' work in the course of the season; with gentle exercise on each of the intermediate days, and particularly a sweat on the day before hunting. There is an account, however, of one horse which followed the fox-hounds seventy-five times in one season. We are not aware that this feat has ever been exceeded.

We have before said that the horse fully shares in the enthusiasm of his rider; and it is beautiful to watch the old hunter, who, after many a winter's hard work, is turned into the park to enjoy himself for life. His attitude and his countenance when, perchance, he hears the distant cry of the dogs, are a study for the contemplation of the artist.

"I was entertained by listening to an Arab peasant," says Sir John Malcolm, in his *Sketches in Persia*, "describe a fox-hunt which he had seen in the English style. 'There

came the fox-devil; he pointing with a crooked stick to a clump of date-trees; there he came at a great rate. I hallooed, but nobody heard me, and I thought he must get away; but, when he got quite out of sight, up came a large spotted dog, and then another, and another. They all had their noses to the ground, and gave tongue—whow, whow, whow—I was frightened. Away went these devils, who soon found the poor animal. After them galloped the Foringees (a corruption of Frank, the name given to a European over all Asia), shouting and trying to make a noise louder than the dogs. No wonder they killed the fox among them.'"

The following is related by a Wiltshire gentleman, who was an eye-witness of the scene he describes:—"I lent a fine and fiery mare to a friend from town, who had come down to try his Essex dogs against our Wiltshire breed: at the close of a very fine day's sport, we had to beat a small furze-brake, and, for the purpose of better threading it, my friend dismounted and gave the bridle of the mare to the next horseman. Puss was soon started; the "halloo" was given; the person who held my mare, in the eagerness of sport, forgot his charge, loosed his hold, and, regardless of any other than his own steed, left mine to run, like Mazeppa's, "wild and untutored." But, to the astonishment of all, instead of so doing, or even attempting to bend her course homewards (and she was in the immediate neighbourhood of her stable), she ran the whole course at the tail of the dogs; turned, as well as she could, when they brought the prey about, and afterwards by very much outstripping all competitors (for the run was long and sharp), she stopped only at the death of the hare, and then suffered herself to be quietly regained and remounted. This I conceive to be certainly an extraordinary proof of a natural love for the sport; but what renders it more remarkable is, that I had only attempted to ride her twice before, after any hounds whatever. The brace of dogs that were slipped at this course were my own, and the groom had been in the habit of exercising them with the mare. Whether this had any effect on her actions I am not competent to give an opinion."

The passion of horses for hunting was, on one occasion, exemplified in a most extraordinary manner. Three of the horses of the Brighton coach chanced to have finished their stage, and to have been standing, unharnessed, at the instant Lord Derby's stag-hounds passed in full cry. They started off and joined the hunt, and had the gratification of a run of some length, until the hounds were whipped off. Even after this, they followed the stag till they got up to his haunches, and then chased him three miles on the high road, when the stag taking a high fence, left them snorting on the wrong side, to be secured by those in quest of them.

This deer was more fortunate than one which was hunted by the same pack, as the result will show. Some years since, the Earl of Derby turned out from the Oaks a noble deer, for a day's sport, which, after having traced a very long tract of country, entered the grounds of the late Mrs. Smith, of Ashted, near Epsom, Surrey, and being closely pursued by the hounds, it actually leaped through the drawing-room window, the sash of which was down, followed by the pack in full cry. The consternation occasioned in the family, by this strange event, was indescribable. At that critical moment no one was in the apartment, some ladies having quitted it a few minutes previously. The window was almost dashed to atoms, and every part of the room, with its rich carpet and corresponding furniture, covered with blood and dirt. The animal was soon dispatched by the ferocity of the dogs; and perhaps so curious an event is not to be found in the annals of sporting. As a companion, however, to this scene, a stag, *graduating* towards the city of Oxford, at length took to one of the streets, through which he was followed by the hounds in full cry, into a chapel, and there killed, during divine service.

A horse that had, a short time before, been severely fired on three legs, and was placed in a loose box, with the door, four feet high, closed, and an aperture over it little more than three feet square, and standing himself nearly sixteen hands, and master of fifteen stone, hearing the cheering of the huntsmen and the cry of the dogs at no great distance, sprung through the aperture, without leaving a single mark on the bottom, the top, or the sides.

If the horse, then, be thus ready to exert himself for our pleasure—and pleasure alone

is here the object—it is indefensible and brutal to urge him beyond his own natural ardour, so severely as we sometimes do, and even until nature is quite exhausted. It is, perhaps, not now so frequent; but formerly we scarcely ever heard of a "hard day," without being likewise informed, that one or more horses either died in the field, or scarcely reached home before they expired. Some have been thoughtless and cruel enough to kill two horses in one day. One of the severest chases on record was by the king's stag-hounds. There was an uninterrupted burst of four hours and twenty minutes. One horse dropped dead in the field; another died before he could reach the stable; and seven more within a week afterwards.

It is easily conceivable, and it does sometimes happen, that, entering as fully as his master into the sports of the day, the horse disdains to yield to fatigue, and voluntarily presses on, until nature is exhausted, and he falls and dies. Much oftener, however, the poor animal has, intelligibly enough, hinted his distress; unwilling to give in, yet painfully and falteringly holding on; when the merciless rider, rather than relinquish one hour's enjoyment, tortures him with whip and spur, until he drops and expires.

However unwilling the hunter may be to abandon the chase for the time being, he who "is merciful to his beast" will soon recognise the symptoms of excessive and dangerous distress. To the drooping pace, staggering gait, heaving flank, and heavy bearing on hand, will be added a very peculiar noise. The inexperienced person will fancy it to be the beating of the heart; but that has almost ceased to beat, and the lungs are becoming gorged with blood. It is the convulsive motion of the muscles of the belly, called into violent action to assist in the now laborious office of respiring.

In this dangerous situation, life almost quivering in the horse's nostrils, Mr. Youatt says—

"Let the rider instantly dismount. If he has a lancet, and skill to use it, let him take away five or six quarts of blood; or if he has no lancet, let him cut the burs with his pocket-knife as deeply as he can. The lungs may be thus relieved, and the horse may be able to crawl home. Then, or before, if possible, let some powerful cordial be administered. Cordials are, generally speaking, the disgrace and bane of the stable; but here, and almost here alone, they are truly valuable. They may rouse the exhausted powers of nature; they may prevent what the medical man would call the reaction of inflammation; although they are the veriest poison when inflammation has commenced.

"A favourite hunter fell after a long burst, and lay stretched out, convulsed, and apparently dying. His master procured a bottle of good sherry from the house of a neighbouring friend, and poured it down the animal's throat. The horse immediately began to revive; soon after got up, and walked home, and gradually recovered. The sportsman may not always be able to get this, but he may obtain a cordial-ball from the nearest farrier, or he may beg a little ginger from some good house-wife, and mix it with warm ale, or he may give the ale alone, or strengthened with a little rum or gin. When he gets home, or if he stops at the first stable he finds, let the horse be put into the coolest place, and then well clothed, and diligently rubbed about the legs and belly. The practice of putting the animal, thus distressed, into 'a comfortable warm stable,' and excluding every breath of air, has destroyed many valuable horses.

"We are now describing the very earliest treatment to be adopted, and before it may be possible to call in an experienced practitioner. This stimulating plan would be fatal twelve hours afterwards. It will, however, be the wisest course, to commit the animal, the first moment it is practicable, to the care of the veterinary surgeon, if such there be in the neighbourhood, in whom confidence can be placed."

The labours and the pleasures of the hunting season being passed, the farmer makes little or no difference in the management of his untrained horse; but the wealthier sportsman is somewhat at a loss what to do with his. It used to be thought, that when the animal had so long contributed to the enjoyment of his owner, he ought, for a few months, to be permitted to seek his own amusement, in his own way, and he was turned out for a summer's run at grass.

The pages of the *Sporting Magazine* contained, some years back, a controversy on the merits of summering the hunter. Two celebrated writers were engaged in it; one under the signature of Nimrod, who recommended summering the hunter in the stable; the opponent to this measure was the veteran John Lawrence, who advocated the summering of the hunter in the field as the best means of renovating him, and restoring him to his pristine vigour. This controversy was carried on in no very measured or complimentary terms.

The practice, however, of turning out the hunter seems to us so natural as well as beneficial to the animal, that we feel surprised that a dispute upon such a question could have arisen. The following remarks upon this subject seem so judicious, that we cannot withhold them from our readers. They proceed from the same writer on the *Horse*, to whom we have before alluded.

"Fashion, which now governs everything, and now and then cruelly and absurdly, has exercised her tyranny over this poor quadruped. His field, where he could wander and gambol as he liked, is changed to a loose box; and the liberty in which he so evidently exulted, to an hour's walking exercise daily. He is allowed vetches, or grass occasionally; but from his box he stirs not, except for his dull morning's round, until he is taken into training for the next winter's business.

"In this, however, as in most other things, there is a medium. There are few horses who have not materially suffered in their legs and feet, before the close of the hunting season. There is nothing so refreshing to their feet as the damp coolness of the grass into which they are turned in May; and nothing so calculated to remove every enlargement and sprain, as the gentle exercise which the animal voluntarily takes while his legs are exposed to the cooling process of evaporation, which is taking place from the herbage he treads. The experience of ages has shown that it is superior to all the embrocations and bandages of the most skilful veterinarian. It is the renovating process of nature, where the art of man fails.

"The spring grass is the best physic that can possibly be administered to the horse. To a degree, which no artificial aperient or diuretic can attain, it carries off every humour which may be lurking about the animal; it fines down the roundness of the legs; and, except there be some bony enlargement, restores them almost to their original form and strength. When, however, the summer has thoroughly set in, the grass ceases to be succulent, aperient, or medicinal; the ground is no longer cool and moist, at least during the day; and a host of tormentors, in the shape of flies, are, from sunrise to sunset, persecuting the poor animal. Running and stamping to rid himself of his plagues, his feet are battered by the hard ground, and he newly, and perhaps more severely, injures his legs. Kept in a constant state of irritation and fever, he rapidly loses his condition, and sometimes comes up to August little better than a skeleton.

"Let the horse be turned out as soon as possible after the hunting season is over. Let him have the whole of May, and the greater part, or possibly the whole of June; but when the grass fails, and the ground gets hard, and the flies torment, let him be taken up. All the benefits of turning out, and that which a loose box and artificial physic can never give, will have been obtained, without the inconvenience and injury which attend an injudiciously protracted run at grass, and which, arguing against the use of a thing from the abuse of it, have been improperly urged against turning out at all."

Stable-summering the hunter is favourably considered by Count Veltherin. "I hope," he says, "I may be permitted to adduce something from my own experience, having, for nearly thirty years, constantly had at my country seat from seventy to eighty horses—partly saddle, partly coach, draught, and breeding horses and colts; and that, from predilection to horses, I have always bestowed particular attention upon them. For a long time it has not been customary, on well-managed estates in this part of the country, to turn horses to grass in summer, or to give them green food in the stable, with the exception of brood mares and their foals."

Mr. Appleby, in his *Letters on Condition*, thus states his method of summering the hunter:—"The first step I should take would be to put the horse into a loose box, if convenient, and, by degrees, diminish his corn,

giving him an hour's walking exercise as usual. I should then give him two doses of physic, which would not only cool his habit of body, so as to prevent the danger of inflammatory attacks, but would have such an effect on his legs as would enable me to see what injury had been done to them in his work, whether there were any ligamentary enlargements, any injury to the joints or sinews, any callous substances produced by blows; or, in short, anything going wrong. The clear state of his legs, which this treatment will produce, would prevent the possibility of working in the dark, as they will become prier—to use the language of grooms—in three weeks, than they would at the expiration of three months' run at grass in the summer." Mr. Appleby, however, further observes, that, under favourable circumstances, he would strongly recommend turning out. "In case of having recourse to blistering, it is most serviceable; and, after spring, almost necessary; but then the hunter should be turned out only at night, and into a place where there is but little grass, and have two, if not three feeds of corn a-day; but nothing else to eat till he goes out, unless it be a few vetches, for four or five days at a time, when they are young and tender, in the months of May or June; but these should not be repeated more than three or four times, as they tend to make horses very foul; and when *in pod* are most injurious to them."

When we come to speak of the economy of the stable, we will also treat of the management of the hunter.

THE HACKNEY.

A Hack, in the modern stable phrase, signifies a road horse, and not merely a horse let out to hire, as some of the uninitiated suppose.

The road horse is more difficult to meet with in perfection than even the hunter or the courser. There are many reasons for this. The price of the hackney, or the horse of all work, is so low, that he who has a good one, will not part with him; and it is by mere accident that he can be obtained. There are also several faults which may be overlooked in the hunter, but which the road horse must not have. The hunter may start, may be awkward in his walk, or even his trot; he may have thrushes or corns; but if he can go a good slapping pace, and has wind and bottom, he can both be *put up with* and prized; but the hackney, if he be worth having, must have good fore-legs, and good hinder ones too; he must be sound on his feet, even tempered, no starter, quiet in whatever situation he may be placed, not heavy in hand, and never disposed to tumble down.

The hackney, like the hunter of the present day, is always a horse with some portion of racing blood; the whole English race, even to the cart-horse, being more or less imbued, and equally improved by it. Thus our road horses are half, three parts, seven-eighths, or thorough-bred. The two latter degrees are, in several respects, not so well fitted for the purpose of travelling as the former: chiefly on account of the tenderness of their legs and feet, their longer stride, and straight-kneed action, not so well adapted to the English road pace, the trot. Nevertheless bred hackneys are elegant and fashionable, and, when good canterers, pleasant to ride; insomuch, that a certain colonel of the guards of former days, insisted there was the same difference to be felt in riding a bred hack and one without blood, as between riding in a coach and in a cart. One good property in thorough-bred road horses is, that they seldom shy—many of them never.

The road horse should have a considerable, lofty, yet light fore-hand or crest; a deep and extensive shoulder; be well raised at the withers; straight backed, and have substantial loins and wide fillets, the croup not suddenly drooping, nor the tail set on low. The head should not be thick and fleshy, nor join abruptly to the neck, but in a gradual or tapering form; the eye full, clear, and diaphanous. The fore-arms and thighs, with plenty of muscular substance, should be of reasonable length, but the legs should, at no rate, be long. Much solid flat bone beneath the knee, is a great perfection in a hackney; and the feet, standing straight, turning neither inwards nor outwards, should be of tough, dark, shining horn, and the heels wide and open. The saddle-horse's fore-feet should closely approach each other, the wide chest being rather adapted to the collar. Notwithstanding this near approximation of the fore-feet, no apprehension need be entertained of the horse's cutting himself in speed, or

knocking his pastern joints, since these defects arise almost invariably from the irregular pointing of the toe, inwards or outwards, for which, neither a wide chest nor the most skilful farriery has ever yet provided a sufficient remedy. A saddle horse, of any description, can scarcely go too close before, or too wide behind.

Perhaps the best pedigree for a road horse to have, is to be bred from hackney stock on both sides, more particularly for a trotter. The high road is the proper theatre of exercise for such horses; but there may be sometimes a necessity for exercising them on the pavement, as is the case in London, where the pace should never exceed the slow trot.

The author of *The Horse* says—"The hackney should be a hunter in miniature, with these exceptions. His height should rarely exceed fifteen hands and an inch. He will be sufficiently strong and more pleasant for work below that standard. He should be of a more compact form than the hunter, and have more bulk, according to his height; for he has not merely to stand an occasional, and perhaps severe burst in the field, but a great deal of every-day work. It is of essential consequence that the bones beneath the knee should be deep and flat, and the tendon not *hid in*. The pastern should be short, and although oblique or slanting, yet far less so than that of the race-horse or hunter. There should be obliquity enough to give pleasant action, but not to render the horse incapable of the wear and tear of constant and, sometimes, hard work. The foot is a matter of the greatest consequence in the hackney. It should be of a size corresponding with the bulk of the animal—neither too hollow nor too flat; open at the heels, and free from corns and thrushes. The fore-legs should be perfectly straight. There needs not a moment's consideration with the public, to be convinced that a horse with his knees bent, will, from a slight cause, and especially if he is over-weighted, come down. The fact, however, is, that a horse with bent fore-legs has rarely broken knees. The back should be straight and short, yet sufficiently long to leave comfortable room for the saddle between the shoulders and the haunch, without pressing on either. Some persons prefer a hollow-backed horse. He is generally an easy one to go. He will canter well with a lady; he may not carry so heavy a weight, nor stand such hard work, but it is a great luxury to ride him. The road horse should be high in the fore-hand, round in the barrel, and deep in the chest; the saddle will not then pass too forward, but the girths will remain firmly fixed in their proper place."

A good hack will travel fifty or sixty miles a day with ease; but for long-continued journeys, thirty or forty miles a day is as much as should be required. Let no man expect great performances, unless his horse be full of hard meat, and in CONDITION. Should a man be forced to ride an animal a journey with his full burden of grass-flesh upon him, he must at first ride him moderately; and by virtue of good solid corn-feeds, his horse will, in a month, attain condition.

Many persons ride long stages—say thirty or forty miles—without feeding; but it is inconsiderate, and is injurious to the horse. Moderate feeds at the different stages, and an ample one at the last, are most beneficial; a quartern of oats, with a handful or two of beans, are sufficient quantities during the day; at night, half a peck of oats and a few handfuls of beans; so that a hack upon a journey of considerable length, may be allowed from a peck and a quarter, to a peck and a half of oats. Hasty travellers will yet find an advantage in starting at a very moderate pace, and in finishing the last three miles of a stage, especially in hot weather, as leisurely as their haste will admit, since, by such means, they will save time; as their horses, on reaching the inn, will be the sooner dry, and ready to feed. On the road, the horse may be indulged, every eight or ten miles, if he requires it, with a few go-downs of water; and in hot weather, over hard roads, and with fast travelling, when the shoes acquire a burning heat, it is most refreshing to the animal to ride him over his pasterns, momentarily, through any water that may be accessible. But a caution of much moment must have place here. Be the weather hot or cold, a horse in a state of perspiration, should never be kept standing any length of time in water.

In fast travelling, every horseman of common sense will ease his hack up the hills; in going down also, if he values his own neck and his horse's knees, he will do the same.

We have heard of a respectable butcher, who

kept some good horses. He had a famous mare that carried him from Birmingham to Nottingham and back within the twelve hours. This was no mean performance, the distance there and back being close upon a hundred miles. The butcher spoke of it as not being much of an effort. He said the general pace of his horse was eleven miles an hour, and on going down hill he sometimes dismounted, which he considered to be very refreshing to the mare, he being a heavy man.

When a hack, always known to ride quiet, does not set off readily, or makes a stop on the road, the rider may be assured that it arises from some sudden painful bodily affection, or something misplaced and galling in his furniture. The rider should instantly dismount, and examine both horse and tackle, at all points. The animal may be suddenly griped, or seized with a fit of stranguary, which will appear from his dilated nostrils, sweating at the ear-roots, staring coat, and attempts to stale. Aged and worked hackneys are liable to the strangnary; in which case, all the rider can do is to lead him about gently, and give him time to void the dripping urine.

Arrived at the inn, and the horse cool, no extra care or solicitude is required; he may be led into the stable, stripped, rubbed over, whilst eating a lock of hay, and soon be ready for his feed of corn.

There is nothing more refreshing to a hard-ridden animal, and for abating the excessive and painful heat and tension in his joints and sinews, than to have his feet and legs well washed and bathed in warm water. It is a good precaution used, if the inside of the saddle be made dry and comfortable. If he should not feed well, nor eat his corn with an appetite, it is a hint that rest would be acceptable; and it should be complied with.

It will be wise to keep the old adage in view, "that a master's eye makes his horse fat;" either himself or his groom should attend at every feeding-time, to see that the horse has justice done in his food, as to quality as well as quantity.

There are many highly interesting anecdotes illustrative of the intelligence of the hackney.

Seldom do we meet with so near an approach towards mind in the brute creation, as was evinced by a horse of Horncastle, Lincolnshire.

A Mr. Treevor, of this place, was in possession of a horse, which was, at times, let loose in a yard adjoining the stable, where stood a pump and a water-trough. This horse was endowed with an amount of sagacity rarely possessed by the same species. He actually could pump from the well the water he wished to drink. As the pump was frequently used by many persons in the course of a day, it was supposed the docile animal had learned this extraordinary art by noticing them. As the yard which surrounded the pump was always open to public inspection, many persons have seen him elevating the handle with his nose, and then pressing it down in the same way. Such of our readers as may have experienced the corroding bitterness of that sorrow which the unkindness of prejudiced neighbours inflict, will doubtless admire, as a pleasing trait in the character of this noble animal, the amiable instinct, the generous friendship which inclined him to supply a fellow-companion, another horse in the same yard, with a daily banquet from the trough, into which he pumped for him a sufficiency of water, even before he attempted to satisfy himself. Such an instance of neighbourly kindness is rarely exhibited, even among mankind, far less among animals of a much inferior race, and not possessed of even the highest quadrupedal instincts.

Again, a horse having been turned into a field by its owner, Mr. Joseph Lane, of Fascombe, in the parish of Ashelworth, was missed the next morning, and the usual inquiries were set afoot, as to what could have become of him. He had, it seems, been shod a few days before; and, as it frequently happens, got pinched in one of his feet. Feeling, no doubt, a lively sense of the necessity of being properly shod, and desirous of relieving the cause of pain, he contrived to unhang the gate, which opened into his pasture, with his mouth, and make the best of his way to the smithy—a distance of a mile and a-half from Fascombe—where he waited respectfully at the door, until the bungling artist got up. The smith relates, on opening his shed, that he found him there; that the horse advanced to the forge, and held up his ailing foot; and that he himself, upon examination, discovered the injury, took off the shoe, and replaced it more carefully, which having done, the sagacious creature set off at

a merry pace homewards. Soon afterwards Mr. Lane's servants passed by the forge in quest of the animal; and, upon inquiry, received for answer—"Oh, he has been here, and got re-shod, and is gone home again."

A curious instance of the faculty of memory exhibited in a hackney, occurred at Bristol, some years ago. A person recognised a horse, bestrode by a countryman, to be one which he himself had lost about nine months before. He seized his property, and put in his claim. "This is my horse, and I will prove it in two minutes, or quit my claim." He then liberated the animal from restraint, let him go at large, and declared his proof to be in the fact that the horse would be found at his stables at some distance; a circumstance verified in a few minutes, by the two claimants and several bystanders repairing to the stables, where they found the horse "quite at home."

The hackney has often figured in trotting-matches, a few of which have, from time to time, found their way into print, even beyond the ephemeral fame of a sporting paper.

A curious match once took place on the Beaconsfield-road, when a Mr. Causton undertook to trot his horse seven miles in half-an-hour; and accepted bets that he performed each mile within four minutes and twenty-two seconds—a piece of nice calculation, which was achieved in good style.

A horse belonging to Mr. Dyson, which had been picked up in Smithfield for a trifle, having accomplished thirty miles in two hours and forty-nine minutes, was produced by Mr. Brian against another, which cost seven pounds, to perform forty miles in four hours, carrying fifteen stone. This struggle "came off" over a ten-mile piece of road, near Hockerill, for one hundred guineas. The lanky emblem of blood and bone, above seventeen hands high, was mounted by an old jockey of the same build, and did the first ten miles in fifty-four minutes ten seconds, the second ten miles in fifty-six minutes fifty seconds, the third ten miles in sixty-three minutes, and the fourth ten miles in sixty-three minutes forty secouds—winning by two minutes and twenty seconds under the time. The horse never once broke from a trot; and the rider was more fatigued than the animal he bestrode.

The second great match between the slate-coloured American horse, and Mr. Dyson's Wonder, was another extraordinary instance of trotting. It took place on Sunbury-common. The match was for Mr. Fielder and Mr. Dyson to ride their own horses. Mr. Dyson took the lead, and was fifty yards a-head at the end of the first mile, and the American horse never had a chance at any one period, and was beaten with the greatest ease, by about two hundred yards. Neither horse broke through the match, and the ground—three miles—was done in eight minutes and forty-three seconds. What makes this performance the more wonderful, is not only the speed, but the extraordinary weights which were carried. The riders were both weighed, to determine a bet, at Kingston, after the match, when Mr. Fielder was found to be thirteen stone twelve pounds, and Mr. Dyson fifteen stone four pounds, without saddles. By this it appears that the winner gave the American horse twenty pounds. The slate-coloured horse was considered, for years, the best in America. Another horse belonging to Mr. Williams, beat the slate-coloured American, and was backed to trot three miles in nine minutes, for one hundred guineas. It had been reported that the horse was lame, and, up to the evening before starting, six to four was the betting on time, and more than two to one was betted before starting. When at speed the lameness was not apparent; but the horse was more than three minutes doing the first mile, and there was no increase of speed during the match. The horse broke into a gallop near the George Inn, when about one hundred yards from home; and the pressure of horsemen was so great at his heels, that the jockey turned him with difficulty, and the match was lost by forty seconds. Some thousands were depending on this race.

A hackney mare, of Mr. Dixon, of Barbican, started at the four-mile-stone on the Romford-road, to trot thirty miles in three successive hours, carrying Mr. J. Coxeter, weighing nearly fifteen stone. Notwithstanding the heavy weight the mare carried, she performed the distance in thirteen minutes and twenty-seven seconds within the given time.

So long ago as 1785, a similar match was

made to trot thirty miles in two hours and a-half, and the accounts state that this was accomplished, leaving four minutes to spare.

Tom Thumb, an American cob, trotted one hundred miles in harness, over five miles of road on Sunbury-common, in ten hours and twenty-three minutes; and this was considered, and admitted to be, an extraordinary feat.

Rattler, another American, the property of the same proprietor, beat the celebrated Welsh mare, Miss Turner, over ten miles of ground between Cambridge and Godmanchester, going the distance in thirty minutes and forty seconds; and this was certainly a feat unprecedented in the annals of trotting in this country. The same animal, driven by Mr. Osbaldeston, his then master, performed five miles of road, between Wittlesford-bridge and Royston, in thirty minutes fifty-eight seconds, beating Mr. Payne's Rochester, an American entire horse, whose nose touched the wheel of the squire's cart on passing the winning-post. Rattler, ridden by his master, beat Mr. Lawton's Driver—a pony which had performed seventeen miles within the hour—trotting thirty-four miles in two hours, eighteen minutes, and fifty-six seconds.

If, however, the feat of Tom Thumb was considered unprecedented, we have to record a time-match which leaves his performance in the shade—that of a mare, the property of Mr. Dixon, of Knightsbridge, which went over precisely the same ground, and completed the hundred miles in nine hours, fifty-six minutes, and fifty-seven seconds! A match cart had been provided for the occasion; and, at twenty minutes to six o'clock on an April morning, the mare started, driven by Mr. W. Stacey, a farmer residing in the vicinity of Kingston, under whose surveillance she had been in training since the previous November, when the match was made. She finished her first twenty miles, with great spirit, in two minutes less than two hours, and was then taken out, and had some gruel given her. In three minutes and a-half she was again on the move, and rather increased her speed in the next twenty miles, to make up for her stoppage, but was still within the four hours; and thus she continued, at the same pace, till she had completed eighty miles, finally winning with three minutes and three seconds to spare! She showed no symptoms of fatigue; and, on entering her stable, began to eat her hay as if she had only come off a moderate stage. After resting an hour, she was gently walked to her training-stable, a distance of seven miles, and continued well afterwards. During her match, she was taken out at the completion of every twenty miles, and cordial-balls, washed down with gruel, administered on each stoppage.

This mare was all English, and no doubt was entertained that she could have accomplished her undertaking in less time. So confident, indeed, was her trainer in her powers, that he offered to back her to do the same distance in nine hours and a-half.

Captain Halford's match to trot eight miles and a-half in half-an-hour, and to carry eleven stone, with a horse *bonâ fide* his property, for one hundred guineas; and a second match, for a like sum, took place over a two-mile piece of ground at Merston Vale. The eight miles and a-half were done in twenty-nine minutes and fifty-seven seconds.

A manœuvre, not dreamt of, was here practised; a jockey of ten stone immediately mounted the same horse, and proceeded on the second match, to the astonishment of all present. The match was lost by thirteen seconds.

Of the comparative merits of the horse and the pony, as hacks, a good judge thus writes:—

"It is, and has for a long time been, a favourite opinion of mine, that a good pony is the best rough-and-ready hack in the world. In a pony is contained, within a small space, what one might call the concentrated essence of strength and speed.

"It is generally supposed, and I am persuaded of the correctness of the supposition, that if you want to ruin a young horse, your best plan is to starve him whilst he is young. Every rule, however, has its exception, and the case of the forest ponies is a most marked exception to this one. Starved in his early youth, the Forester, though small and stunted in appearance, is endowed generally with a more hardy constitution and more untiring endurance, than any other species of horse in this country. Until he is three years old, the forest pony is scarcely looked after, and then

he is taken up by his poor proprietor, exhibiting a shaggy coat, an immense pot-belly ewe neck, big head, and ragged mane and tail. To look at him in this stage of his career, you would suppose that a full-grown donkey was more than an equivalent as an exchange for the animal calling himself a horse, in the style in which he appears. If his owner cannot sell him immediately, he puts him into his cart, and he is supported by a lock of hay at night. The poor animal becomes crippled, by hard work put upon him, in his fourth year; and is, therefore, consigned to the cart of the costermonger or travelling tinker, there to drag on, in hunger and toil, the existence which commenced in hardship and privation.

"But let us turn from this scene of woe, and suppose our pony born under a more auspicious star. A gentleman sees him when he is first caught; and as he flatters himself he is a bit of a judge, observes a good point or two; he has plenty of good feed to spare, and takes compassion upon the poor starveling's hard lot. After a summer and autumn of good living, with an improved appearance, and a spice of wickedness in his eye, the pony is, in the winter, driven into the straw-yard, and shares with the cows all the little comforts of a warm and sheltered shed by night, and a crib well filled with hay by day. During this time his master sees what an improvement has taken place in his nag, and, in the spring, gives orders for him to have a little taste of the saddle and bridle in the way of breaking in. Physicked, stabled, and clothed, the dust of four years is, with no little difficulty, extracted from his jacket, and his natural colour is at length opened to the view. He is at last mounted by his master, who discovers that the ragged rascal bought by him out of charity, is by no means unworthy of his purchase-money: he congratulates himself upon his bargain; and always supposing our gentlemen to be a light weight—about ten, but certainly under eleven stone—he discovers, when his nag is five years old, and in good condition, that he is, without any exception, the best hack that he ever obtained at any price; and, moreover, that by means of good and generous keep, his personal appearance is so wonderfully altered and improved, that no one could have recognised in him the least degree of likeness to the puny forester, that was purchased at the edge of the common for the very sporting price of eight pounds!

"Such, reader, has been the case with me; and I shall ever bless the hour when I rescued from the cart of the costermonger, my gallant little grey. Of course, for hunting, nothing but a full-sized horse will do, whatever be a man's weight; but for coursing and hacking about, give me a good pony. Then again, the prime cost of ponies is not only infinitely less, but they can be kept in condition at a much less expense than a horse: their constitutions are twenty times as hardy; and if your stud consisted only of them, you would never be called upon to pay a farrier's *little account*. But the pony not only shines as a hack for the saddle; in harness he is both useful and ornamental. According to my notions of good taste, there is no turn-out of any nature or kind so pretty as a pair of handsome ponies and a single-bodied wicker carriage. Perhaps I shall be told, in these economic days, that it will not do on account of the expense, as two horses are dearer than one. That position is an erroneous one; for it is by no means an easy task to meet with a good machiner fit for a four-wheeled carriage, well broken, sound, fresh, and handsome, for fifty pounds. I could undertake for that money to buy a pair of ponies, young, handsome, and well-broken; and I might almost add, harness into the bargain. Then, as to the keep; two ponies of thirteen hands in height, can be kept well on the same food that is required by one large horse in hard work. They will give an air and style to a vehicle, which, with one horse, would look shabby and commonplace; and, moreover, will do more work, and go with more ease to themselves, and therefore, of course, more pleasant to the driver."

THE LADY'S HORSE.

Much care seems in general to be used in the selection of ladies' horses; and ladies themselves seem to be sufficiently attentive to the necessary accomplishment of horsemanship. This is evident from the comparatively few accidents which happen to them when riding.

This delightful exercise is now very fashionable, and we feel assured that it is an exercise which combines health with pleasure to the riders, whilst it exhibits both the elegance and the grace of the fair horsewomen in a most marked degree.

For elegance, a lady's pad should have a considerable show of blood, and should seldom exceed fifteen hands in height. The paces should not be rough; and an easy slow trot, the pace of health, is a valuable qualification. The canter is of the chief consequence, and it should be made naturally and handsomely, the neck kept gracefully curved, the mouth having pleasant feeling. Such as have these qualifications are natural canterers, and will last at it, and, at the proper signal, will drop into the trot or walk, without roughness, boggling, or changing of legs. But the first and grand consideration is going safely; for a horse deficient in this respect, is, perhaps, always most liable to fall in his canter. The most graceful canterers may be observed to lead generally with the off-leg; but no doubt there is such an error as a horse, both in his canter and gallop, going with the wrong leg first, to the considerable uneasiness of the rider. This is most felt upon worn and battered brutes, which change their legs to procure a momentary ease.

THE COACH-HORSE.

Before entering upon a description of our carriage stock of horses, we will take a glance at the past, and briefly trace the history of the use of carriages in this country, and recount some feats of pedestrianism, which, previous to the making of roads, necessarily occurred as a means of communication between one locality and another. It is even within our own recollection, when, in Scotland, the half-silly beggar, or gaberlunzie, was employed to carry letters and messages over ten miles of country, from one friend to another; and our ancestors, instead of communicating by post, were obliged to use running footmen, whose extraordinary performances were sufficiently rapid even to raise astonishment. In making a comparison between the former modes of travelling and the present, we feel a glow of satisfaction at the immense improvement which has taken place, and which almost seems to realise the expression that time is left to pant after us. The invention of the steam-engine has proved of the utmost importance. The mechanical genius of England has adapted it to carry a ship over the bosom of the Atlantic, with almost as much safety and certainty as the Locomotive whirls her train over the well-laid rail. By reducing space within a comparatively limited period of time, steam has become a great means of civilisation. It has connected the metropolis of the empire with the smallest of the British Isles; is the most rapid conductor of commerce; and is continually adding to our comforts, by, as it were, bringing "the ends of the earth together." In fact, fifty years ago, men, the most advanced in knowledge, and the most sanguine in the expectation of realising improvements, would be overwhelmed with astonishment at the immense stride the arts and sciences have taken in so short a time.

"In by-gone days, in Scotland," says Chambers, "they had a class of officials called running footmen, of whose pedestrian powers many surprising examples are noticed by tradition. For instance, in the Duke of Lauderdale's house, at Thirlstane, near Lauder, on the table-cloth being, one morning, laid for a large dinner party, it was discovered that there was a deficiency of silver spoons. Instantly, the footman was sent off to the duke's other seat of Lethington, near Haddington, full seventeen miles off, and across hills and moors, for a supply of the necessary articles. He returned with a bundle of spoons in time for dinner."

Again, at Hume Castle, in Berwickshire, the Earl of Home had one night given his footman a commission to proceed to Edinburgh, thirty-five miles off, in order to deliver a message of high political consequence. Next morning early, when his lordship entered the hall, he saw the man sleeping on a bench; and, conceiving that he had neglected his duty, was about to commit some rash act, when the poor fellow awoke, and informed Lord Home that his commission had been executed; and that, having returned before his lordship was stirring, he had only taken leave to rest himself a little. The earl, equally astonished and gratified by the activity of his faithful vassal, rewarded him with a little piece of ground, which, to this day, bears the name of the *post rig*—a term equi-

valent to the postman's field, and an unquestionable proof, as all the villagers at Hume devoutly believe, of the truth of the anecdote. The custom of keeping a running footman did not cease amongst noble families in Scotland till the middle of the last century.

The Earl of March, father to the Duke of Queensberry, and who lived at Neidpath Castle, near Peebles, had one named John Mann, who used to run in front of the carriage, with a long staff. In the head of the staff there was a recess for a hard-boiled egg, such being the only food taken by Mann during a long journey.

Next to the pedestrian feats of our forefathers, were their equestrian performances. The pedestrian was almost independent of roads; and hence the amazing rapidity of his feats. The rider was not just so independent; but still a rough way was of less consequence to him than to a wheeled vehicle. Hence it arises that some journeys performed on horseback, in former times, are not much less wonderful than the above examples of rapid pedestrianism.

Some horsemen of the present day would think it no mean feat, we suspect, to perform, on horseback, one hundred miles a day; yet this appears insignificant, compared with the account of the rapid travelling of the messenger who conveyed to Edinburgh the tidings of the death of "Good Queen Bess."

Queen Elizabeth died at one o'clock on the morning of Thursday, the 24th of March, 1603. Between nine and ten, Sir Robert Carey left London, after having been up all night, commissioned to communicate the intelligence to her successor James, at Edinburgh. That night he rode to Doncaster, a hundred and fifty-five miles. Next night he reached Witherington, near Morpeth. Early on Saturday morning he proceeded by Norham, across the Border; and, that evening, at no late hour, kneeled beside the king's bed at Holyrood, and saluted him as King of England, France, and Ireland. He had thus travelled four hundred miles in three days, resting during the two intermediate nights. But it must not be supposed that speed like this was attained on all occasions.

When we consider the state of the roads at the period at which this performance took place, it cannot be otherwise viewed than as somewhat extraordinary.

At the commencement of the religious troubles, which happened in the reign of Charles I., when matters of the utmost importance were debated between the king and his northern subjects, it uniformly appears that a communication from Edinburgh to London, however pressing might be the occasion, was not answered in less than a fortnight. The crowds of nobles, clergymen, gentlemen, and burghers, who, at that time, assembled in Edinburgh, to concert measures for opposing the designs of the court, always returned to their homes after dispatching a message to King Charles, and assembled again a fortnight after, in order to receive the reply, and to take such measures as might be called for. Even till the last century was pretty far advanced, the ordinary riding-post between London and Edinburgh, regularly took a week to the journey.

In consequence of the inattention of our ancestors to roads, and the wretched state in which these were usually kept, it was long before coaching, of any kind, came much into fashion. Though wheeled vehicles of various sorts were in use among the ancients, the close carriage or coach is of modern invention. The word *coach* is Hungarian; and the vehicle itself is supposed to have originated in Hungary. Germany certainly appears to have taken the precedence of the nations of Western Europe in using coaches. They were introduced thence into England some time in the 16th century; but were, after all, so little in vogue throughout the whole reign of Elizabeth, that there is no trace of her having ever used one. Wheel-carriages, however, having some resemblance to chariots, such as were used by the ancients, were brought into fashion in the time of Richard II.; for we find that "he rode from the Tower of London to the Miles End, and with him his mother, because she was sick and weak, in a whirlicote." This vehicle was little better than a litter put upon wheels. In the reign of Elizabeth we find it mentioned in Stone's *Survey*, "That divers great ladies made them coaches, and rode in them up and down the countries, to the great admiration of all the beholders."

Lord Grey de Wilton, who died in 1593,

introduced a coach into Ireland, the first ever used in that country. One was introduced into Scotland, we rather think from France, about the year 1571. It belonged to the famous Secretary Maitland, of Lethington, who, during the civil war between the adherents of Mary and those of her son James, made a journey in that vehicle from Edinburgh Castle, which he was holding out for the queen, to Niddry in West Lothian, for the purpose of holding a consultation with some others of her friends; the first time, it is believed, that a close carriage was ever used in Scotland.

Fynes Morison, who wrote in the year 1617, speaks of coaches as recently introduced, and still rare in Scotland. For a long time, these conveniences were only used by old people, who could not well bear riding. The young and active despised them, as tending to effeminacy, and as not being so quick of movement as the horse.

The Duke of Buckingham, in 1619, first used a coach with six horses; a piece of pomp which the Duke of Northumberland thought proper to ridicule by setting up one with eight. Charles I. was the first British sovereign who had a state carriage. Although Henry IV. was killed in a coach—the only one, by the way, he possessed—his ordinary manner of appearing in the streets of Paris was on horseback, with a large cloak strapped on behind, to be used in case of rain.

In Scotland, previous to the time of the civil war, coaches were only used by persons high in the state. When the Earl of Roxburgh, an aged minister, was endeavouring to appease the Covenanters, in 1637, he was pulled from his coach in the High-street of Edinburgh, and maltreated.

Taylor, the Water-poet, complains, in the reign of Charles I., that large retinues of men were now given up by the great, since they had begun to use coaches.

Till 1564, the only mode of travelling, equivalent to that by stage-coaches and locomotive carriages in the present day, was by the strings of horses led by the carriers. It is these caravans that Falstaff and his friends are described by Shakespeare as attacking at Gadshill.

About the year just mentioned, the long waggon for goods and passengers came into use. Stage-coaches originated less than a century later, and were for a long time confined to the great lines of road throughout England; and, till 1678, there were none for distances to which the term stages could be applied. The journey from London to Oxford, in the reign of Charles II., required two days, the space being fifty-eight miles. That to Exeter, one hundred and sixty-eight miles and a quarter, required four days.

In 1703, when Prince George of Denmark went from Windsor to Petworth, to meet Charles III. of Spain, the distance being about forty miles, he required fourteen hours for the journey, the last nine miles taking six. The person who records this fact, says that the long time was the more surprising, as, except when overturned, or when stuck fast in the mire, his royal highness made no stop during the journey.

In 1742, stage-coaches must have been more numerous in England than in Charles II.'s time; but it does not appear that they moved any faster. The journey from London to Birmingham, one hundred and sixteen miles, then occupied nearly three days.

The rate of coach-travelling, previous to the country being intersected with railroads, excited almost as much wonder among ourselves as it did among foreigners. The horses were then very hard wrought; for the art of road-making had not attained its present state of excellence, and, in wet weather, some of the coaches might be half-axle deep or more.

"When I was a school-boy," says a writer, giving a description of the road between London and Parkgate—the principal place where passengers landed from Dublin, before Holyhead became the regular station for the Dublin packets—"Parkgate, in Cheshire, was the port whence the Dublin packets sailed: there were a few at Holyhead; but there all the principal intercourse between the countries was effected. At that time, probably not one craft of any description passed in a month between Dublin and Liverpool. Upon the arrival of a packet at Parkgate, the passengers made their way, as they best could, to Chester, diverging thence to the several places of their destination. I believe there might be a stage of some kind or other, that undertook to deposit people within some limited time in London.

GOING TO MARKET.

TRAVELLING CART STALLION.

plying for public hire; but the manner of accomplishing the journey was most usually by means of post-coaches. These carriages were supplied by a person of the name of Paul, of the White Lion, who was celebrated at that period all over England for the magnificence of his stud. With him it was a hobby, and must have been a very expensive one. He kept no colour but greys, and of these, he had always from thirty to forty pairs in his stables. I can well remember what splendid cattle they were—his boys wearing black velvet caps, gold bands and tassels, and yellow silk jackets. He built his own carriages, dark brown, lined with scarlet morocco—doing the whole thing upon a grand scale. A party of six, with one or two servants, would contract with Paul for a set down in London. He sent with them one of his own carriages, with its team of greys, and postillions: they accomplished the stages as arranged every day—probably of five-and-twenty miles each—and at the end of eight or nine days found themselves in the metropolis. With this fashion of travelling commenced my experience of the road; having made my first visit to Babylon the Great through the agency of one of these long jobs. At a later date I can call to mind, on an occasion of being sent for home in the Midsummer holidays, sticking fast in the middle of the turnpike-road between Whitchurch and Malpas—the latter certainly no misnomer. This antecedent of M'Adam was a desert of red sand, quartered by cart-wheels to the depth of two or three feet; and as the phæton in which I made my journey ran upon wheels of about half the diameter of those by which the ruts had been formed, of course we were let in up to the axles, where we were anchored. This took place in the nineteenth century!"

Long before the commencement of the present century, however, many of the leading lines from the metropolis, for a circle of from twenty to fifty miles around it, were far advanced towards their present excellence; but where a journey of two or three hundred miles was to be performed, it went so small a way in the matter of expedition, that the first sixth-part of it could be accomplished at eight miles an hour, where the remainder could with difficulty be done at a better speed than four. When the use of carriages first began to supersede the old method of transporting men and merchandise upon horseback, it became absolutely necessary to devise some plan for forming a solid surface upon the bridle-ways of sand, which offered as little support to a wheel as a fallow to the coulter of a plough. Hence arose the system of paving the centre of the turnpike-roads, so generally adopted in most of the midland counties, and of which many specimens are still in existence, more particularly in Cheshire and Lancashire. With the heavy waggons, and their slow pace, while the great reduction in the draught upon this pavement effected a vast saving in the horses, the roughness of the surface was felt as no inconvenience. The gentry, in their coaches suspended from flexible C springs, passed smoothly over them; and, as it was almost the universal fashion to drive from the saddle, accompanied by outriders, the servants also escaped dislocation. But there was a class of devoted wretches for whom no such good luck was found, and who, in an honest effort to procure their daily bread, underwent the agonies of an earthly purgatory without any parallel in a Christian land. When Mr. Palmer invented mail-coaches, as might be expected, he committed a few small oversights; among these were the boxes of the coachmen, which were without springs, and were constructed upon the common principle. The consequence was, that the seats upon which they were destined to perform their vocations, were pieces of pine, or other obdurate plank, supported upon staudards springing from the beds of the fore-axles. These "devil's sedans" were covered with a tanned bull's hide, to which, as a material for sitting on, granite is as an air cushion. An old sufferer, who for the last ten years of his life drove between Chester and Birkenhead, was on the Holyhead mail from Chester to Stafford in those *hard* times for dragsmen. For better than five-and-thirty years this martyr was a most communicative coachman, and, withal, had an ambition for saying smart things. On one occasion, when asked how his constitution could have supported such inhuman exercise, and whether it had not proved fatal to men less robust than he was? "Why, sir," he replied, "it was well enough when once we got used to

it: but I assure you the case-hardening was no joke: some died under the operation, and some did not; but there never was a man who tried it that it did not make him think of his *latter end*."

The epoch from which we may date the rapid advance in improvement as regards every department of the road, is coeval with the system of remodelling our highways upon the plan of Mr. M'Adam. That the scheme of road-making which bears the name of that gentleman was not of his invention, all who have travelled in Scotland and Ireland must have known. Still we are indebted to him for its introduction into this country, and for many judicious innovations by which he brought it to its present perfection. As the facilities for locomotion improved, so did the appliances to aid it.

The call for increased speed upon the commercial roads was afterwards answered on the Birmingham line by the appearance of three "Tally-ho's," distinguished as the "Patent," the "Independent," and the "Eclipse." Looking back to the time they were at work—their chronometrical regularity for half a score years—their pace, and the style in which they were worked through the country, and not at the ends alone, we shall hardly find anything in the mail-coach line altogether more complete than they were. Awful forebodings attended their starting: their speed was pronounced suicidal, and the waste of human life that was to result from it fearful to contemplate. But these speculations all proved vain. The only fatal accident we recollect occurring to any of them, was the death of poor Peck, the guard, who was killed by a fall off his coach while it was standing still.

In the way of fast-work, however, combined with the fashion in which it was done, certainly the *pas* must be given to the coaches which were put on the Brighton road by Mr. Israel Alexander. Of these there was but one opinion expressed by such as possessed experience in the coaching business, coupled with a wonder, how, by having all England to choose from, it was possible to get together such a lot of horses. On this road the public found elegance combined with speed. Taken all in all, Alexander's "Criterion," with a certain then noble marquis for dragsman, was perhaps the most correct specimen of a stage-coach that has ever appeared; but a vast deal of money was sacrificed during the short reign that this concern kept its place in the public eye.

It is now time to speak of the carriage horse.

The Clevelands, and the powerful blood-like carriage stock, bred in Yorkshire, and other northern counties, came from the best of the Norman mares, crossed by the Arab only, the Persian blood being considered less likely to throw stock combining symmetry and substance. In his magnificent work on *The Illustrations of the breeds of the Domestic Animals of the British Islands*, Professor Low says, in reference to the Cleveland Bay, that "it is the progressive mixture of the blood horses of higher breeding with those of the common race, that has produced the variety of coach-horse usually termed the Cleveland Bay; so called from its colour and the fertile district of that name in the North Riding of Yorkshire, on the banks of the Tees. About the middle of the last century, this district became known for the breeding of a superior class of powerful horses, which, with the gradual disuse of the heavy old coach-horse, became in request for coaches, chariots, and similar carriages. The breed, however, is not confined to Cleveland, but is cultivated through all the great breeding districts of this part of England. It has been formed by the progressive mixture of the blood of the race-horse with the original breeds of the country. To rear this class of horses, the same principles of breeding should be applied as to the rearing of the race-horse himself. A class of mares, as well as stallions, should also be used, having the properties sought for. The district of Cleveland owes its superiority in the production of this beautiful race of horses to the possession of a definite breed, formed not by accidental mixture, but by continued cultivation. * * * * Although the Cleveland Bay appears to unite the blood of the finer with that of the larger horses of the country, to combine action with strength; yet many have sought a further infusion of blood of the finer, with that of the larger horses of the country to combine action with strength; and others have sought a still further infusion of blood nearer to the race-horse. They are accordingly crossed by hunters, or

thorough-bred horses, and thus another variety of coach-horse is produced, of lighter form and higher breeding; and many of the superior Cleveland curricle and four-in-hand horses are now nearly thorough-bred. The bay colour is in the most general estimation, but the grey are not unfrequently used."

The principal points to be looked at in the coach-horse are a deep and well-proportioned body, bone under the knee, and tough feet, perfectly sound, and somewhat open.

Before, and in some parts, the cruelties practised towards the coach-horse were very great, often arising out of the competition of different proprietors; but these are now much diminished. A more generally enlightened sentiment of humanity pervades the country in reference to the brute creation; still, in the metropolis, instances of cruelty may not unfrequently be witnessed towards the over-worked horses of the omnibus and cab.

The former kind of vehicle, when first used in London, had usually three horses; but now it has generally only two. These trot and stagger up Holborn-hill, Blackfriars-bridge, and other metropolitan hills, with little allowance made for their acclivity, thus punishing the poor animals, and distressing their wind; when perhaps only the difference of five or ten minutes' delay in the journey, might enable the horses to perform it with comparative ease.

The French say, "England is a hell for horses;" but qualify the censure by a compliment that "England is a paradise for women." But however the complimentary portion of this sentence may be taken, the censure as respects our treatment of the horse, remains in all its severity.

THE CAVALRY HORSE.

In the breeding of cavalry horses, a different proportion of blood is necessary, according to the kind of service for which they are intended. Some of those for the lighter troops have more blood in them than others, and the household troops are from half to three-fourths bred. Formerly the cavalry horse was large and heavy; and, notwithstanding the grand and imposing action which he exhibited, with the beautiful style of going to which he was trained, he was "found wanting" when brought into active service. Yet our heavy household troops were found quite equal to the task of repelling the formidable charge of the cuirassiers at Waterloo. In a national point of view, there are few objects to which the eye of government ought to be more vigilantly directed, than to the improvement of our cavalry horses, or to the due proportioning of their capacity to the duties they have to perform. "If from the habit of running short distances," says the author of *The Horse*, "and at the very early ages of one and two years, with light weights, there is a deterioration in the strength and stoutness of our thorough-bred horses, they will become every year less and less fitted for getting stock sufficiently hardy and powerful to do credit to the courage and discipline of our cavalry."

THE CART OR DRAUGHT HORSE.

The cart breed was the cross between the Norman stallions and the largest of the Flanders mares, a race substituted in latter years for the pack-horse—bred probably from our own breed and Norman horses—when the improvements in roads enabled the adoption of wheel-carriages for the transit of merchandise, to supersede the conveyance by back loads. Thus the aboriginal blood—impoverished by an uninterrupted course of breeding in-and-in—by the introduction of fresh seed, became renovated and invigorated; the common consequence of such change whether in animal or vegetable life.

It speedily became obvious to all who were engaged in breeding cattle of every description, that vast advantages resulted from the CHANGE OF BLOOD. Hence arose the practice of hiring the males of various kinds from distant districts for the season. It is to this practice, as much as the improved methods of treatment, that we owe the excellence of every species of our live stock. Perhaps, it is hardly necessary to observe, that to the difference of soil, is to be attributed such variation in the latter breeds, as have now settled into distinct classes.

Cleveland horses of the heavy sort, have been known to carry upwards of seven hundred pounds, sixty miles in twenty-four hours, four times a week.

The Suffolk Punch, a horse of a slower pace, is the produce of the Norman stallion and

the Suffolk cart mare; but the true Suffolk, like the true Cleveland, is, now, nearly extinct. The Punch takes his name from the round punchiness of his own form, and is a valuable animal, although degenerated. The Suffolk was wont to be crossed with some of our hunters, and the Duke of Richmond got many excellent carriage horses from this union.

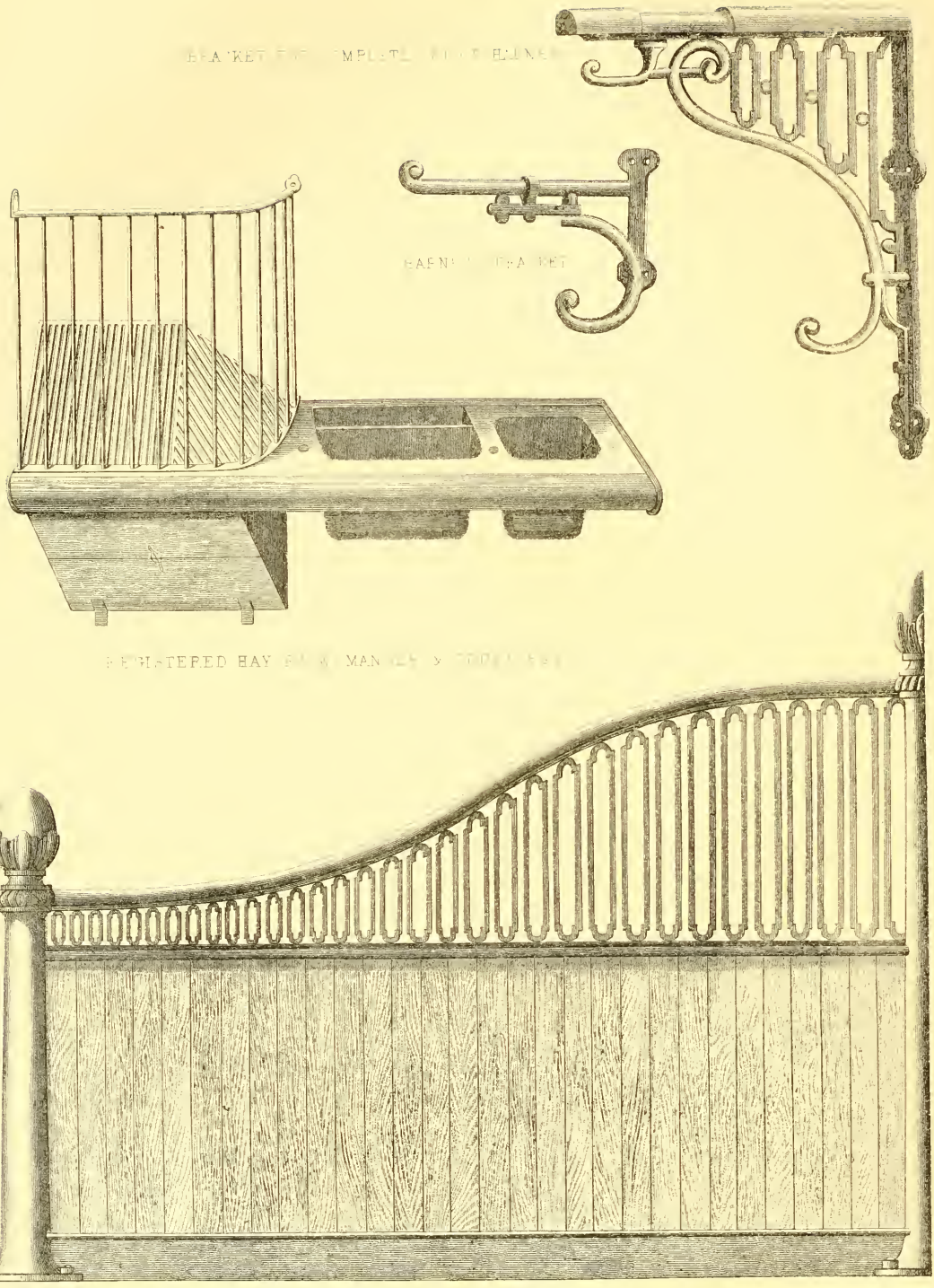
The Clydesdale is another excellent breed of draught horses, especially adapted for the agricultural purposes of a hilly country. It is chiefly bred in the Vale of the Clyde in Scotland, whence it derives its name. One of the dukes of Hamilton originated the Clydesdale by crossing the Lanark mare with the Flanders stallion. Most of the southern parts of Scotland are supplied with the Clydesdale from this district; and he has found his way even into some of the southern counties of England. Speaking of his appearance and qualities, Mr. Low says, that "the Clydesdale horse, as he is now bred, is usually sixteen hands high. The prevailing colour is black; but the brown or bay is common, and is continually gaining upon the other, and the grey is not unfrequently produced. He is longer in the body than the English black horse, and less weighty, compact, and muscular, but he steps out more fully, and has a more useful action for ordinary labour. He draws steadily, and is usually free from vice. The long stride, characteristic of the breed, is partly the result of conformation, and partly of habit and training; but however produced, it adds greatly to the usefulness of the horse, both on the road and in the fields. No such loads are known to be drawn, at the same pace, by any horses in the kingdom, as in the single-horse carts of carriers and others in the west of Scotland. Although they are inferior in weight and physical strength to the black horse, and, in figure and strong action, to the better class of the draught horses of Northumberland and Durham, yet they possess properties which render them exceedingly valuable for all ordinary purposes. On the road they perform tasks that can scarcely be surpassed; and in the fields they are found steady, docile, and safe."

The heavy black horses, such as we see in the brewers' carts of London, are bred principally in the midland counties from Staffordshire to Lincolnshire. They are majestic-looking animals; and as they have great loads to draw, they require to have great weight themselves, so as not to be shaken in the performance of their duties. All our heavy draught horses, and some even of the lighter sorts, have recently been much crossed by the Flanders breed. This has improved them by raising the fore-hand, flattening and deepening the legs, and giving them greater activity.

CHAPTER V.

ECONOMY OF THE STABLE, AND GENERAL MANAGEMENT OF THE HORSE.

Sanitary improvements in all that relates to the well-being and happiness of the inhabitants of our larger towns and cities, have, for a number of years, occupied the attention of philanthropists and medical men; and whilst the dwellings of the human have been gradually undergoing a change for the better, we are happy to say that some of those of the equine species have been receiving attention. This, however has not been so general as it is hoped it will yet become. We have still to lament, with Mr. Stewart, in his admirable work on *Stable Economy*, that "stable architects have not much to boast of. Their sole ideas are limited to shelter and confinement. If the weather be kept out, and the horse be kept in, their objects are attained. If light and air be demanded, the doorway will admit them. If the horse has room to stand, it matters little, though he have none to lie; and if you can get him into the stable, what consideration is it, though his loins be



IMPROVED STABLE FITTINGS BY MESSRS GEORGE SMITH & Co GLASGOW

strained, or his haunch bruised in getting out of it."

Loftiness is one of the most desirable attributes of a stable, and due regard ought to be paid to its proper ventilation, for horses as well as men are poisoned by breathing in an impure atmosphere. We will, therefore, here consider some of the most essential requisites of a healthy stable.

AIR.

Mr. Clarke, of Edinburgh, was the first to advocate the use of well-ventilated stables; and after him, Professor Coleman, of the Veterinary College, established them in the quarters of the cavalry troops. Their advantages were soon made apparent in the discontinuance of diseases that formerly dismounted whole troops of soldiers, and in the consequent pecuniary saving which they effected to the government. Chemical science has now ascertained, with the utmost exactitude, the atmospherical conditions required for the preservation, in a healthy state, of the animal functions, and Lavoisir adduces a striking instance of the sensible malaria of an atmosphere breathed over and over again by a number of animals confined within a limited space. He shows that when the air out of doors contained 27 parts of oxygen, and 73 of nitrogen = 100, the air in the lowest ward of the central hospital at Paris, contained 25 parts of oxygen, 71 nitrogen, and four of fixed air = 100. Before the play in the theatre of the Tuileries, the air was 27 parts oxygen, 73 nitrogen; towards the termination of the performance, it was 21 parts oxygen, 76½ nitrogen, and 2½ fixed air. Thus, in the hospital, the oxygen, or living principle, had decreased as twenty-one to twenty-seven, or nearly one-fourth. This proves the necessity of having a well-aired stable for the horse, as well as a well-aired house for oneself to live in. "We have frequently observed," says Mr. Karkeek, "a kind of balance between the respiration and the digestion; and he who is a careful observer of horses in a healthy, as well as in a diseased state, must have noticed that there is a certain balance between the quantity of vital air received into the lungs, and the quantity of food which can be digested in the stomach." Again, "the blood requires pure air as its food; the first effect of the air is to remove the carbonic acid, which the venous blood takes up in the circulation; and when this is effected, the properties of the blood become instantly changed. In the commencement of this process, the air is the active agent, and removes the carbonic acid from the circulation; but when this is effected, the blood then becomes the acting power, and attracts a portion of the atmosphere. The pure air, or at least it ought to be so, then occupies the place of the carbonic acid which is just removed."

These facts are sufficient to show the necessity of having the stable well-ventilated. Indeed, the principal cause of mange, bad eyes, glanders, grease, swelled legs, and inflamed lungs, witnessed in many horses, is on account of the smallness, and the ill-ventilated state of their stables. A stable, therefore, with a loft over it, should never be less than twelve feet high; and if it is to contain three horses, it should not be less than twenty, or twenty-two feet long, and fourteen wide. An aperture should be made near the top of the wall opposite the door, to allow the fœtid or foul air to escape; and to admit the fresh and wholesome air, other two holes, of the same size, should be made on each side of the door, at about the height of a foot from the ground. Stables, however, are not, at all times, built in situations where the convenience of a good ventilation can be readily obtained. Where this is the case, the following remarks by Mr. Brett, veterinary surgeon of the 12th Lancers, when in the Manchester barracks, supply some hints.

"Suppose a stable to be blocked up by other buildings on all sides except at its two ends. In that case I propose to have a large wooden tunnel, two feet square, running the whole length of the stable under the mangers; and if it should be a double stable, one tunnel under each row of mangers. These conduits are to come through the end walls of the stable, and to be open at both ends on the outside, for the purpose of admitting a thorough draught or body of air through them. This main stream of air is to be equally dispersed about the stable, by means of perpendicular wooden shoots, or chimneys, six inches square, emanating from this main tunnel, one at the

head of each stall partition. They should be seven or eight feet long, so as to avoid a draught on the horse's eyes, and open at their tops like chimney-tops, and should stand out two feet from the wall. The rarefied state of the air in the stable, will cause a constant flow of cool air through this main tunnel, and up these chimneys; and will equalise the temperature of the stable, and entirely obviate the draught of wind that blows in at the horizontal holes in the walls of our stables as at present ventilated. These perpendicular chimneys may have one or two other apertures in them besides the one at their tops, at different heights, that may be opened or closed at pleasure, to admit air by means of a door with a hinge and button, opening on that side next the wall, whereby a direct current of air upon the horse will be averted. If these air passages should not be thought sufficient, other horizontal tunnels branching from the main one, might run from it at right angles under each stall partition, and terminate in a perpendicular wooden chimney, six feet high at each heel-post."

The window of the stable should be at the south-east end, and the door at the opposite end. The window should be as high as the ceiling will admit of, and in size proportionate to that of the stable. In a stable of twelve feet high, it need not come down more than four feet, and will then be eight feet from the ground, and out of the way of being broken. The frame of the window should be movable upon a pivot in the centre, and opened by means of a cord running over a pulley in the ceiling, and fastened by means of another cord.

With a window of this kind, in a stable with three or four horses, no other ventilation will be required. A person never need be solicitous about finding openings for the air to enter, when there is sufficient room above, and means for it to escape.

It is unnecessary to enlarge on this branch of our subject, as enough has been said to show the absolute necessity of keeping up a supply of pure air in the stable. That its temperature may be known, no gentleman's stable should be without a thermometer, which should never be allowed to sink below forty or fifty degrees in the winter, or ascend above seventy in the summer.

LIGHT.

This is another of the most important elements in a well-constructed stable.

Where much light is admitted, the walls of a stable should not be white, but of a stucco, or lead colour, and better if painted; for then they may always be washed clean with soap and water, as well as the stalls, rack, and manger. This should be done once in two or three weeks, or a month at furthest. If the walls are boarded up to the height of about five feet, and this, as well as the stalls, painted of a light wainscot colour, it will look extremely neat, and the under part of the wall will be kept drier, and appear more comfortable. A stable should be lighted by means of an Argand lamp, suspended from the ceiling, and movable. This will give a far better light, is cheaper, and more secure than any other contrivance whatever, except gas-light; and, if properly trimmed, will burn without a particle of smoke. As a general rule, dark stables are uncleanly; and they are the frequent cause of making the horse start, and of giving him sore eyes, when he emerges from them. No stable, however, should have too strong a light, as, like the bed-room of his master, it is a place of rest. The proper quantity, then, should be regulated, which a little observation will very soon enable every possessor of a horse to do.

THE FLOOR.

A stable, when properly paved, and kept moderately clean, requires only a shallow wide gutter, twelve inches wide, and one inch deep. The best floor for a stable, by far, is hard brick; and next to that, limestone, not less than one foot square. The floor of the stall should never incline more than one inch in a yard; and the inclination should be continued back to the gutter only. "If the reader," says Mr. Lawrence, "will stand for a few minutes with his toes higher than his heels, the pain he will feel in the calves of his legs will soon convince him of the truth of this remark, 'that too great a slope strains the back sinews of the leg.' Hence, when a horse is not eating, he always endeavours to find his level, either by standing across his stall, or else as far back as his halter will permit, so that his hind legs meet the ascent on the other

side of the channel." It is also remarked by Mr. Blaine, that—

"In the stables of dealers in carriage horses, an ascent in the standings of nearly two inches in the yard is sometimes made, to give a greater appearance of height to the yet unfurnished four-year-old horses, which are thus often passed upon the unwary as horses of five years old. Is no strain put upon their legs? Our experience, which has been somewhat extensive in these matters, convinces us that the inequalities in the standings of horses is a fertile source of contraction of the feet. What but the pain and inconvenience which follow an uneven position, occasions horses, when not feeding, to be so frequently found standing across instead of lengthways in their stalls? How frequently, also, will the horse, boxed in a stall, be found with his croup turned towards the manger? To avert these evils, and yet to prevent the retention of the urine, the smallest possible slope should be allowed, which should proceed uniformly to the bottom of the stall. A central grating, with a cesspool, is an imperfect remedy for the evil; for there must still be a general inequality of surface to carry the urine to the centre. It is further injurious by retaining the urine we wish to avoid; and, moreover, it promotes a draught of cold air from without, if it be so constructed as to carry the urine out of the doors. It may, also, be remarked, that a central cesspool is utterly useless for mares. It is, therefore, the best plan to furnish each stall with a grating placed over a small trapped drain, at the foot of each stall, which will carry off both the urine and the washings into one general cesspool out of doors, and from which, being stopped by the trap, nothing offensive can pass up through the gratings."

THE STALL, THE MANGER, AND THE RACK.

The width of a stall should not be less than six feet, clear. But when there is sufficient room, it is a much better plan to allow each horse a space of ten or twelve feet, where he may be loose, and exercise himself a little. This will be an effectual means of avoiding swollen heels, and a great relief to animals that are worked hard.

With respect to the rack and manger—the manger should never be less than eighteen inches deep; eighteen inches from the front to the back part; and two feet in length.

In post and waggon stables, where the stall is made for a pair of horses, the manger will be placed at each end, and the rack in the centre. It will then be necessary to put one bar in the centre of the rack, on the top, from the front to the back part, to prevent the horse from throwing out the hay with his nose.

The rack may have staves in the front, like a common rack; but it is better to have it partly closed in front. The back part of the rack should be an inclined plane, made of wood; should be gradually sloped towards the front, and should terminate about two feet down. Such a rack will hold more hay than ever ought to be put before one horse. The advantages of this rack are numerous. The saving in hay that may be effected by its use is so apparent, that it need not be dwelt upon. A great saving also may be made in oats, by so fastening the horse's head during the time of feeding, that he cannot throw any of them out of the manger. If a horse is allowed a peck of oats a day, and has, as he may have, one-eighth part of them thus saved, it will amount to nearly a peck in a week. There must not, however, be a diminution in his allowance on this account. A horse should have one peck of oats in twenty-four hours; but then he should not have more than from eight to twelve pounds of the best hay in that time, given at four, or three times at least.

This kind of rack and manger, from being boarded up in front, will effectually prevent the litter from being kept constantly under the horse's head and eyes, by which he is compelled to breathe the vapours which arise from it. It will also prevent him from getting his head under the manger, as sometimes happens, by which means, not unfrequently the poll-evil is produced.

The length of the halter should be only four feet from the head-stall to the ring, through which it passes. This will admit of the horse lying down with ease, which is all that is required.

The ring should be placed close to that side where the manger is, and not in the centre of the stall. The sides of the stalls should be sufficiently high and deep to prevent their occupants from biting or kicking each other.

LITTER.

Instead of having a large corn-chest in the stable, a handsome seat might be made at the back part of it, extending as far as may be necessary. In this there may be partitions to separate the beans or the bran; and places might be made to rest the arms upon, so that a gentleman might sit down comfortably, and have the pleasure of seeing his horses taken care of. A comfortable stable will be found conducive to the health of the horses, and will be an inducement to the groom to attend to every little circumstance which may contribute to cleanliness. He will not allow the smallest bit of dung to remain swept up at one end, or into a corner, as it commonly is. The pails should be kept outside, and not standing about the stable, as they usually are. If it be necessary to take off the chill from his drink, it is much better, and more easily done, by the addition of a little hot water, than by suffering it to stand in the stable: and while the horses are at exercise, the litter should be all turned out to dry, and the brick floor well washed, or swept out. Some litter should always be allowed for a horse to stale upon, and this should be swept away as often as it is necessary, to prevent offensive smells. Litter dried during the day, will serve again as well as fresh straw for the bottom of the bed, and be perfectly free from smell. That which is necessary to be kept under a horse, that he may stale with comfort, and without splashing himself, is not considerable, and may be changed once a-day. A great saving might be made in it, by turning it out, and drying it; and if a shed were built adjoining the stable, this could be done at all times, and the horse might be cleaned in the shed in wet weather.

Neither dogs, fowls, nor goats, should ever be permitted to enter a stable; and dung should be kept at a distance from it. Whilst speaking of these general arrangements, it may not be amiss to notice a good contrivance in cleaning horses; that is, to have two straps, one on each side of the stall, about one yard from the head of it; by these the horse may be fastened during the time he is cleaned, and he will be effectually prevented from biting the manger or the groom. He will also be kept back in the stall, which will enable the groom to clean more perfectly the front of his fore-legs, chest, and neck; and to move round him. This is better than strapping him to the rack. When the common rack and manger are preferred, the rack-staves should be straight, and brought nearly down to the manger. This may be done without the necessity of a hay-loft, and the manger may be made deep and wide, as already described.

GROOMING.

Although it is not usually the case that gentlemen, themselves, look after their own horses when they are stabled; still, we presume that many desire to have such a knowledge of the stable department, as will enable them to judge of the competency or incompetency of their grooms; for it is not the good fortune of every one to have a thoroughly professional groom, who understands his business, and who is trustworthy in all the parts he has to perform in it. There are some who undertake the duties of grooms without understanding hardly anything about a stable; and while gentlemen do not inform themselves of the necessary duties and business of this department of their establishments, they are likely to be greatly imposed upon, or injured, through the ignorance, indolence, or artfulness of the pretenders they may have engaged. Little as may be thought of the merits of looking after a horse, it has been remarked, that not more than one in ten, upon the average, of stablemen employed in livery-stables and dealers' yards, know even the simple process of properly cleaning or dressing one, though this is the first or principal thing required of them, and nearly all they have to do. This is the case even after they have followed the occupation for years, and been industrious, pains-taking men, who did not spare their labours. Since such is the fact, it is evident that there is more art attached to this profession, than at first suggests itself to the mind.

There are certain natural qualifications which should be preferred and sought after, if they can possibly be found, in the person that has the care and management of valuable horses. Above all things he should be *sober, mild, and patient* in his temper, so that he is not easily provoked; for material injury has been done by passionate persons incautiously striking

horses in a wicked manner, with whatever instrument might be in their way; sometimes the corners of the curry-comb, the broom-stick, twitch-staff, or even the stable-fork. We have heard of a groom, who, in a fit of rage whilst stopping a horse's feet, for which he had a small trowel, actually drove it into the animal's side between two of his ribs. The person who looks after horses should be industrious, and not sparing of his labour at any hour or season; for horses require much attention to make them fresh and comfortable; and if a groom is sparing of his labour, they will soon show it, as there are few kinds of work harder than grooming a horse properly. It is true, that an indolent groom may escape censure or complaints of persons not very particular or discerning; but those who are judges cannot be imposed on. The appearance and condition of the animal will discover itself, and cannot escape their notice: for when a person knows that everything is allowed to keep his horses in proper condition, and also *knows when his horses are in the condition in which they ought to be*, he will never be satisfied to see them otherwise.

There is no good groom that has not a pride in seeing, not only his horses, but everything in his department in the first style of condition and cleanliness. Where this disposition exists all goes well. Confidence is inspired, and a trust, which otherwise might be withheld, freely and voluntarily reposed in him, regarding all that appertains to his system of management. With these natural qualifications there are practicable requirements, which, with attention, observation, and an apt capacity, may easily be acquired.

The grand aim of a groom ought to be to put his horses in what is called condition: let us, therefore, consider what is meant by condition. This word is variously applied to the state of the horse, though widely different from what is here implied. For instance, we say, a horse is in *condition for sale*; that implies he is in flesh, his legs clean and fresh, his coat decently fine, and perfectly sound; *a horse may be all this, but not in condition for work.* Another horse is said to be in good working condition. Such might be said of a post-horse, that is bare of flesh, his joints enlarged, and his legs puffed with windgalls; yet this horse is capable of doing much work; and his being worked more than is requisite to keep him in condition, *has put him out of condition.*

Condition, therefore, without an expletive, implies that perfect state of body and limbs in which the whole system is in the most vigorous state, and capable of the greatest exertion, if required. This cannot be either obtained or preserved without strictly adhering to three things; viz., proper food, proper grooming, and necessary exercise. Neither of these must be omitted, nor injudiciously employed; for, like medicine, properly administered, each does good, but is capable of doing much injury, if profusely taken or misapplied.

Stable hours should be kept with strict regularity. All animals appear to have a knowledge of time; and it may be observed, in many instances, that they observe the periods as correctly as those who attend them, and who, let it be remembered, have recourse to time-pieces. The horse knows his stated hours; and if he is not attended to, particularly to feed and water at the accustomed time, he will be watching and fretting with much anxiety, and oftentimes will call and ask for his food, in such a manner as those accustomed to horses cannot fail to understand. Regular and stated hours should be punctually kept, with as little variation as the season or circumstances may require—say five o'clock in summer; but as the days shorten, a later hour is admissible, unless horses are to be ready at an early hour for hunting, or otherwise. In such cases, two hours, at least, before they are wanted, the stable should be visited. If this is not done, and if sufficient time is not allowed to look after *things*, they cannot be done as they should.

The first duty of the groom on going to stable, after throwing his eye round to see if any horses are loose, cast, or the like, is to rack and feed. The judgment in racking is to give the horse but little at a time, that he may eat it with an appetite, first clearing out his rack, &c., &c. If a horse leaves hay that is good and sweet, some cause must be assigned for it, and it must be examined into. Sometimes cats will foul the hay; and horses are very nice in their food, when not kept scanty. If the animal appear to be in health, and the hay has not been blown on by other horses, but is fresh and sweet, it may reasonably be supposed that

he is too plentifully fed, and leaving hay for the sake of oats: this should be guarded against; therefore, if hay that is good and clean in moderation, is given to him, it is better to shorten his allowance of oats, to bring his stomach to a comparatively small quantity. His morning's racking should be one quarter of his daily allowance, which, on the average, is about three pounds for his breakfast; for abundant feeding in the morning is not good. A horse cannot work agreeably to himself when over-full; and, therefore, the plan of feeding sparingly in the morning should be adopted. If you want some exertion from him, do not suppose that a full belly will make him perform it better. It is the food that he has digested, and from which he has obtained that nutriment and its consequent stimulus that is to support him in his work, and not what you cram into him at the time you want him for great exertion. A good horse, in proper condition, will not flag in twelve hours, if he is required to be at work that time, and, on a moderate computation, supposing he has carried his rider a hundred miles, without, as it is termed, drawing bit. This, however, is not to be expected from every horse; none but thorough good animals, in proper condition, can undergo such extraordinary exertion.

The quantity of hay which should be given should be well shaken, to clear it from dust and seeds; and if it is very dry, as it sometimes will be, it ought to be sprinkled with water, to make it more agreeable to the horse, when he will eat it with better appetite. Many horses, when they perceive, or instinctively suppose they are going out with the hounds, or have seen the rider come into the stable with his *scarlet coat on, and in his white cords*, refuse to eat their hay or oats. This, we imagine, arises from an impatient anxiety regarding the animating prospect of the chase, of which most horses are fond, but some uncommonly so; but whether they disregard their food from this feeling, or whether they refuse it, knowing they will be better able to gallop with an empty stomach, it is difficult to determine; certain it is, however, that horses never perform the worse for it; and it may be taken as not a bad prognostic, when a horse refuses his food under such circumstances. It is very common, however, for a horse to be off his food after any great exertion; and this is by no means a pleasant circumstance, especially to a *true horse-man*.

After having racked with hay, the next feed, as it is termed, is to serve him with oats. Here we are proceeding in the routine that is to be daily observed; for, were we to treat of things out of this regular order, young hands might be studying what they should do, and what ought to be done first; and it is no uncommon circumstance to see *some*, that have been in the stable employment for a considerable length of time, not know what to do first, and occasion themselves trouble and loss of time, by doing that which is not urgently required. In serving the oats, whatever is deemed a sufficient allowance for the horse, for the day, whether it may be three quarterns or a peck, one-fourth of the quantity should now be given. As sweet and clean food is most agreeable to the animal, as well as beneficial, carefully sift the corn from dust, blow away the chaff, and pick out anything which may be deemed unfit or unpleasant. Frequently will be found among them, rat's dung and cat's dung; therefore clear the manger with a whisp of hay or straw, and throw in the oats; let them be spread with the hand, to prevent the horse from taking too greedy a mouthful at a time, and swallowing them without chewing.

While the horses are eating their first feed of corn, which, it must be recollected, is to be given immediately on entering the stable in the morning, prepare the saddles and exercising bridles, that they may be ready to be taken out. These being ready, and placed on for exercise, give the horses a few go-downs of water; then, if it be an establishment of some considerable extent, give orders to the stable-boy to make fair the stable during your absence, in the following manner. If it should be a single-horse stable, this process may not be required so minutely: first, throw all the dung off the litter, clear out behind, then turn up the driest and best of the litter under the manger, and the wet and muck turn out behind; this being removed to the dung-heap, sweep clean out, then take a bucket of water, and wash the stall out well. After the water is run and swept away, take the bedding that has been put under the manger, and place it behind the horse's stall, against the wall; by doing so, all

the disagreeable smell that may probably arise from the bedding being allowed to remain under the manger, will be removed, and, in all likelihood, the horse prevented from being affected with diseases of the eyes, glanders, inflamed lungs, &c., &c. This being done, take a little of the litter and shake it in the stall, for most horses stale on first coming into the stable, from exercise, and this will induce them to do so freely. Thus will the stable be free from any effluvia which arise from the dung and urine.

The stable being made clean, next commences the cleaning of the horses. This is a work that requires more knowledge and judgment than at first appears. The curry-comb is the first thing to be applied, and great attention should be paid to the proper mode of its application. Some horses require much of the curry-comb; others, none: this depends on the state the animal is in, the time of year, &c. Horses that have their coats long and full of dust, such as are just taken up from grass, or such as are come out of persons hands, that either do not know, or do not take the pains to keep their coats clean and fine, will require the free use of the curry-comb. In reference to the comb, its teeth and sharpness should be proportioned to the thickness, length, and foulness of the coat. For horses that have been kept in stable, properly groomed, and have their coats fine, thin, soft, and clean, requiring no other use of the curry-comb than merely to clean the brush, or occasionally to rub off any dung that may be on them, the teeth of the comb should be remarkably even and dull, not to scratch them.

These things being attended to, after stripping the clothes off, the curry-comb should next be used, always beginning on the near side at the hind-quarters, and using it in proportion to the length and foulness of the coat. If the coat is fast on, long, full of dust, and very filthy, it may be used freely to loosen it, or the sweat that is dried and fastened on the skin and roots of the hair, will appear like a white and saltish dust; but it is not to be expected that all the dust shall be got out at once. It must be a work of time; and to attempt it by using the curry-comb too much, the coat will be set on end, the pores of the skin will be opened, and the horse will, in consequence, be very liable to take cold, which will obstruct that imperceptible perspiration which, in a healthy state, is always going on; and which, if suppressed, causes to be thrown up an ichorous discharge, which will dry into small scabs. The coat will then stare, put on a russetty appearance; be rough, and have a very disagreeable look when compared with those horses whose coats are fine and clean, such as the race-horse, or the hunter, when got into proper condition. Another thing to be observed is, that if it be during the season when the horse is changing his coat, when the hair will come off freely with the curry-comb, it is not advisable to be too free in the use of the comb for the purpose of removing the coat, but let this have its time to come off. With good feeding the end will be obtained quicker than by scratching the horse's skin with the comb. Providence has wisely ordained that the horse's coat, if exposed to cold, shall grow long, and if he is kept warm, it will remain short.

Proceeding to curry on the hind-quarters, for the purpose of unmatting the hair and loosening the dust, it is necessary to descend down the quarters, particularly remembering to rub off all dried dung, and taking care not to injure or scratch the horse's legs. It is to be observed that the curry-comb is not to be used below the hock, unless some dung may be there. Whilst employed here, you must handle the comb very lightly; and with grey or white horses, stains are very troublesome to remove; but if a wet sponge is taken, and the hair well moistened where the stain is, then a knob of common *stone-blue*—such as is used by washerwomen—put into a piece of flannel, and rubbed well on the stains, will be able to remove them. When this is dry, it must be well brushed off.

After having curried the horse's hind-quarters, proceed on to the back, loins, flank, belly shoulders, arms, chest, and neck, omitting no part to which the comb can be conveniently applied. Tender places, or such as have thin hair, need not be touched, neither need the head be touched. Horses are not ticklish when they are full of the dust occasioned by the natural and imperceptible perspiration of the body; but as they become clean, and their coats short and fine, they are exceedingly

ticklish, and, therefore, it is necessary to be careful to stand in a secure place. After having curried the near side, proceed in like manner to curry the off side; but with the difference of using the left hand, which, after a while, becomes the most convenient. This done, the next proceeding is to whisp off the dust raised by the curry-comb, and to rub and whisp well those places which were not proper for the comb to touch. For this purpose, a whisp of some half-worn straw should be made, but a hay-band is better, which should be prepared for the purpose, by half untwisting it; loosening it thus, it will be doubled about a foot in length, and, loosely twisting it together, it will not scatter so fast, till you have made it as thick as you can grasp. If it is dry and harsh, sprinkle it with water. This will make it work pleasanter, and the dust which is intended to be removed, will adhere to it, and not fly about so much.

In whisping the horse, begin at his head, taking the whisp in the left hand for the near side, and resting the right hand on the most convenient part of the animal, to steady yourself while the whisp is applied. Then change its situation, beginning first at the top of the neck, down to the shoulders, then the under part of the neck, the chest, particularly between the fore legs, down the arms, knees, and the sinews and fetlocks, taking care to rub out the dirt well from the heels, where the curry-comb cannot be brought into use. Having done this, proceed on in the order of his carcase, on the back, sides, belly, croup, and so on to his hind legs, which ought to be cleaned as carefully as the fore ones. After this, whisp in the same manner his off side, only changing the whisp from the left to the right hand.

Proceed next to brush the horse over, after having first cleaned the brush well with the curry-comb. Begin at the croup or rump, and well brush the body backwards and forwards, the brush being in the left hand; for the near side, work up in all parts as before, and finish at the top of the neck; then in leaving it, brush the horse the straight way of the hair, and finish at the near fetlock and heel behind. The same plan should be pursued on the off side, changing the brush to the right hand. Many stable-men attend much to those places that are most conspicuous to the eye, such as the fall of the neck, the shoulders, and hind-quarters. These parts shine the most; and they do not fail to point out these to you, and say how well they look, which may satisfy some persons, but a judge will not be deceived by external appearances. He expects the parts not immediately in view to be equally attended to.

After the brushing, which causes much of the dust to be floating about, when a part of it, in all probability, will again settle on the horse, he should be wiped all over with a linen cloth, beginning, as with the whisp or brush, at the head, and so proceeding to every part. This being done, put on his clothes before finishing with his head, mane, tail, and legs, that he may not chill or take cold while you are about them.

It must be understood that we are here treating of the method to be pursued in the hackney stable, and not in the racing and hunting stable, though there is very little difference in treating the hunter and the hack, except it be in a greater addition of clothing and more dressing, the days he may be lying at rest.

The clothes being properly put on without wrinkles, perfectly smooth, and especially under the roller, loosen the horse's head, take off his stall-collar, and turn him round in the stall, to give his head and ears a complete rubbing and brushing, which is not so easily done with the stall-collar on. The head is now to be brushed over in every part, particularly at the root of the ears, and under the throat; then, with the dusting-cloth, rub and wipe him well; pull his ears through the hands, observing that they are clean and soft, and moderately cool; then comb out his mane and foretop, with a sponge or water-brush, wet the top or roots of the mane, and pass a small cloth for that purpose over it. This cloth being passed from the near side at the top of the mane, and pulled over to the off-side, will make the mane lie smooth. Next put on his stall-collar, and comb out his tail; wipe away any dirt or filth that may be remaining under the tail with a wet sponge, and after with the cloth. The feet of the animal are next to be examined, and the dung and litter picked clean out, and, if necessary, washed. Lastly, the legs are to be rubbed with a clean loose whisp of straw in each hand; for which

purpose you should go down on both knees, pass the whisp over the legs and tendons, then finish with passing the hands down in like manner, to feel that they are perfectly smooth, and that there are no particles of the straw or thistles, which might be among it, adhering or sticking to the hair. These rubbings will increase the circulation, and, consequently, will promote the absorption of any fluid which may be detained in those parts, and which, too frequently, occasions swelled legs; and, if neglected, the heels may crack, and produce grease, which, with a little extra trouble, may, at all times, be prevented.

The morning's business of the stable being thus completed, the horse will require nothing until noon.

Before proceeding further, we will show the reasons for feeding the hackney, which is not to be fed in the same manner as you would a hunter that has extraordinary work to do; yet a hackney should be always in a condition to be able to perform ordinary work with ease to himself and comfort to his rider.

Moderate exercise for a good hackney is about thirty or forty miles an end, without drawing bit, at the rate of from eight to ten miles an hour. This may be called ordinary work: but to gallop twenty miles, or trot sixteen in an hour, extraordinary work, which, to accomplish, requires a horse to be put through a regular mode of training.

But to return. At noon give him the like quantity of hay as in the morning, and his feed of corn; set the stable fair; that is, put the litter to rights and remove the dung. This is all that is necessary till watering-time, which is about four o'clock, when the horse should be stripped and brushed.

There are some lads who can hardly be persuaded of the necessity for this, alleging that they cleaned the animal perfectly well in the morning; that he had not been out of the stable, and that the clothing prevented dust from settling on him; therefore, they cannot conceive the necessity for it; and many others may be of the same opinion; but the imperceptible perspiration, which is always going on, occasions a scurf, the removal of which greatly relieves the horse. Besides, stripping the cloths off, and brushing him over, greatly refreshes him, and puts the blood into a freer circulation. Wipe him down as before, finishing with rubbing his legs, which must never be omitted, combing the mane and tail, &c., then watering. If there is not a probability of the horse going out, let him have a greater quantity of water than in the morning; and if he be not greedy for water, he will not drink more than will do him good; but, if you perceive his belly getting too large, and he appears washy, he must be restricted. Set the stable fair again, and the work is done until the final doing up for the night.

At about eight o'clock finish for the night by giving him his remaining allowance of hay, which should be double what was given him in the morning, and his remaining feed of corn. Give more abundantly at night, because it will be in so forward a state of digestion in the morning, as not to oppress the wind of the horse when working. This will be a guide how you should vary it upon particular occasions, so as to have the animal in good heart and spirits, but empty, when wanted for expeditious purposes.

The last thing is making up the beds and setting all fair. In making up the beds, contrive to lay all the worst of the litter in the middle or bottom, where the horse is most likely to spoil it. In throwing down the litter which was placed behind the horse in the morning, reserve the cleanest and driest part to top the bed with, making this up high on each side, and fullest towards the hind quarters, that it may be soft and pleasant for him, whichever side he may lay on, as some horses turn frequently in the course of the night. Now throw out all dung, and sweep clean; see that all the stall-collars are secure, loose cloths taken off, and everything set fair, and the routine of the stable is finished.

EXERCISE.

Exercise is so essential to the horse, that feeding and grooming would be of little use, were it neglected, or altogether omitted. It is admitted, that great numbers of horses are killed or spoiled by being over-worked; and it may be doubted whether as many are not injured in London for want of work. In the metropolis there are several persons who keep horses, but who are so occupied with business, that they cannot ride them out oftener than

once in a week, and many don't ride them once in a month. The horses of these persons stand at livery, and they are ordered to be exercised. Men employed in livery stables, have seldom less than six or eight, and we have known some to have ten livery-horses to look after. These men, if they rub off the dung, and occasionally give them a brush over, *omit exercise*, not finding time for it. Gentlemen do not like to see or know that boys are permitted to ride their horses; and, without they keep grooms of their own, their horses will go short of exercise.

Consider, then, those horses that are kept in a livery-stable from week's end to week's end, in many places confined and filthy; that are sometimes moved about, which they *call exercise*, but which is merely a ride of, perhaps, fifty or sixty yards long, in a place made up of litter and dung, with a manure-heap at some part of it. In these cases horses literally breathe only air strongly impregnated with the evaporation of dung. Under such circumstances, it is surprising that they are so well as they are. The disorders with which they are frequently afflicted in such a condition, are principally *cough*, not improperly called *a stable cough*, also weakness in the legs, so that they often make a drop, as it is termed. Various humorial diseases, such as *swelled legs*, *grease*, *farcy*, and, in all probability, inflamed lungs and glanders, also, are the result. At their best, when they look plump and well to the eye, they are faint, and what is termed foggy, and unable to perform more than what would be *common exercise* for horses in condition.

Since, therefore, exercise and air are so beneficial, let us consider in what manner exercise should be given. This is to be regulated according to circumstances. Where animals work two or three days in the week, the resting days require no more than airing exercise, for every horse should have, at least two days in the week, such work or exercise that will give him a good sweating, which throws out, through the pores of the skin, what might lodge in the system and create diseases. It likewise frees the horse of the scurf adhering to the skin, and occasions the coat to look fine. Those days, therefore, that the horse is not wanted for work, he must be exercised for the fresh air which is bracing and strengthening to his limbs, refreshing the body, and creating an appetite. The most eligible time for this is in the early part of the day; but, in wet weather, the best opportunities that appear must be taken advantage of.

If but one horse is kept by a gentleman, he should order his groom, as soon as the stable has been cleaned out in the morning, which is while the horse is eating his first feed, to brush him over, and put on his exercising saddle and bridle. In cold weather, if it is only intended to walk him, the cloth or sheet may be kept on him under the saddle. In warm weather, however, we do not recommend this; for, though a horse's coat may be something the finer by being kept warm, yet he is certainly the more liable to take cold when he is necessarily deprived of it. The most open and airy places should be taken for exercise, during which the step of the horse should try to be improved; and, when he has only walking exercise, he should at least be walked two hours, which will be sufficient. By *aiming to extend his walk*, he may be greatly improved. On returning, thoroughly clean him, and give him his feed. He might be watered while out, provided it can conveniently be done. If a horse is hearty, and inclined to flesh, we would rather recommend the like exercise in the afternoon, where persons have time and convenience, than to shorten his feed for that purpose. It would be much better for the horse; but every one cannot allow his time to be so taken up, for it would be nearly equal to training, and may not be thought necessary. It is more than the generality of horses require; and many inferior-bred animals which look well to the eye, cannot, for a continuance, stand the ordinary work that a horse has in training. Such is the amazing difference of horses. If inquiry be made of many training-grooms, concerning some high-bred colt or other, why he is not *brought out*, they will answer "he would not stand his training;" though, perhaps, in numerous cases, training, in the present day, is screwed up to too tight a pitch.

Should the work of the horse be so moderate as not to occasion a sweat, it is beneficial, about twice a week, to give exercise strong enough to sweat him. This may be done in the pace he is mostly ridden *in*, that he may be practised and improved in it. If he be admired

for his trot, it would be wrong to gallop him, as such an act might unsettle him in his esteemed pace. Therefore trot him out for the space of two miles to bring him to a comfortable sweat, and walk him back. Thus his limbs are extended; his muscles made supple; and his ligaments and tendons strengthened. Inactivity debilitates, and over-exertion may sprain and weaken, but moderate exertion is good both for man and beast.

The sweating of horses occasions considerable labour to clean them; and indolent grooms, and those who have several animals to look after, avoid this part of their business as much as possible. Some would persuade us that there is no necessity for it; but reason and experience teach otherwise.

When a horse is brought in from work or exercise, if in a sweat, or wet and dirty with sloppy roads and rain, he should not be left until made completely dry, clean, and comfortable. Some horses, in good condition, will rub dry and clean in a short time; but others, with long and curly coats, and some from constitution or ill condition, are a long time before they can be made dry; hence, clipping has been introduced; but this we are decidedly opposed to, as it is to be prevented altogether by good grooming. Besides, clipt horses are apt frequently to take cold; hunters, especially, in a slack day. We have known an industrious groom to work at a horse for four hours, and not leave him until perfectly dry; and we have known others to cover them with a cloth, and leave them to dry, before they would clean them. Much depends on the habit the animal has been used to, *constitution*, *condition*, &c., whether he will take injury from being left in his wet and dirt. Those horses, however, that have been properly groomed, and have all care taken of them to keep their coats fine, and, on all occasions, made dry and comfortable, will be liable to take cold, if neglected at these times.

Some persons are fond of physicking or bleeding their horses, when there is no apparent cause or reason for it. Many grooms take upon themselves the duties of bleeding and physicking at their own discretion. It is, therefore, necessary to assign some reason, and to show when, and for what purpose, such modes are to be pursued. It is best to follow such methods as preclude the necessity of either; for, with proper feeding, exercising, and grooming, there will seldom be occasion for physic; but sloth or idleness is the parent of disease; and thus it happens with horses, when they are well fed, and have little or no work—horses not being intended to stand in a stall, and fatten like a bullock—the blood-vessels get overcharged, and a partial stagnation takes place, so that the economy of the whole system becomes obstructed, and cannot perform its several functions. *The stomach* cannot digest its contents; *the lungs* become oppressed, and have not the requisite freedom of expansion; consequently, if timely relief be not given, a catalogue of disorders must ensue, for nature always strives to unburthen herself in some way or other. When any symptom of approaching illness or disorder appears, which may discover itself in various ways, such as by the animal refusing his food, by the appearance of languor or dulness, heaviness of the eyes, heat in the mouth, swelling of the legs, itchings, breaking out in various parts, &c., it will then, in general, be proper to bleed, as a check, and also to allay the irritability of the system. In these cases, bleed according to size, constitution, and the nature of the forboding symptoms of the attack. If a horse is very fat, the same quantity must not be taken from him that would be required were he in good working condition; for his fat, in the first place, debilitates him, and then taking blood in large quantities does this still further. We have known fat horses frequently fall, in consequence of five or six quarts of blood being taken from them at a time, from the erroneous idea that because they were fat, they could lose so much more blood. If, on showing any of the preceding named symptoms, and the horse happens to be overloaded with fat, great caution respecting bleeding should be shown, and not a too large quantity abstracted from him; but with horses in condition for work, five or six quarts may be taken without danger. In bleeding, sometimes, after pinning up the orifice, the horse shakes himself. If so, it may be taken as a sign that the object has been gained, and that the inflammatory action that was going on in the system, has been reduced.

If, however, symptoms and circumstances be compared together, to account, if possible, for

the cause of complaint; if the horse has been well kept, consequently full of flesh, and little or no work—for we do not call walking a horse about to stretch his limbs, sufficient to keep him in health—it may reasonably be concluded that the blood-vessels are prevented from performing their natural functions, and evacuations must relieve them. In this case, we prefer a course of alteratives to violent physicking, as less dangerous.

It may so happen that a horse over-fed, and too little worked, may not discover any symptoms until after a day's riding, and work as some would call it, and from that circumstance it might not be attributed to the want of exercise; but here we deceive ourselves, for disease, or the seeds of disease, may have been lurking in the horse, and could not develop themselves until he was put to unusual exertion, which might necessarily cause the discovery sooner than it otherwise might take place.

If a horse has been in regular work or exercise, with a young and tender constitution, he will sicken at unusual exertion. This is termed, *taking too much out of him;* but, in such a case, the loss of a little blood, with two or three days' rest, will restore him. Sometimes, however, taking too much blood, and, at the same time, when the horse is very hot, suffering him to cool too fast, will, in all probability, instead of decreasing, increase any inflammatory disposition the system may be susceptible of; but if, at the first, we observe that he does not dung, or empty himself freely, as horses generally do when in health, this will draw attention to his state, and he must have speedy relief, to prevent disease coming on in a more dangerous form.

CONDITIONING THE HUNTER.

Every sportsman should know what are the best means to be adopted to get his hunters into condition, and the care and management necessary to their well-being through the season. Hunters are usually turned into good grass after the season is over, though a great deal has been said by some against such a practice. Still we have seen its good effects as often as stabling them; but one man may have convenience to stable his hunters all the summer, and ten others may not have this; consequently, an additional expense would be incurred. But as that which we are about to write is for the use of hunting-men, we shall speak on general principles, which, from practice, we know to be correct.

Grass, it is well known, be it of ever so good a quality, is not a substantial food. It is cooling and opening; and though it makes a horse fleshy, nevertheless, it is not that description of flesh which a horse can work on. If we were to attempt to gallop him to the excess which frequently occurs in hunting, we should find him faint and weak, and the fat which has accumulated in the cellular membranous cavities, would be thrown off in the form of a white lathering sweat. This, if checked, might produce inflammation of the lungs, and the horse become a subject for the knackers. Therefore, the first thing to be done to alter this state of the system, in the best and most expeditious manner, is to bleed and physic, but with caution, always paying great attention to the constitution of the animal.

In the case of horses being taken up from grass, the warmth of the stable is very apt to incline them to itch, and to make them rub themselves a great deal. When they are so inclined, bleeding is highly necessary.

As horses usually have their shoes taken off when turned out to grass, the first thing to be done is to re-shoe him; then he should be bled according to his size; from two to four quarts of blood will be sufficient to take from him. After this let him stand quiet, with his head tied up to the rack, without food of any kind for three or four hours. While he is full of grass, he will not drink much water; but after living on dry food, he will drink plentifully if he is allowed. There is no necessity, however, for stinting him in water until he has taken his physic.

His coat will be exceedingly foul, and full of knits; therefore he will require some good dressings; and the opening of his coat, and the taking of the dirt out, will require him to be clothed. Accordingly, buckle a cloth on with a good broad roller, pretty tight, to assist in reducing the size of his belly. If he has been in the stable three or four days, and emptied the grass out of him, a dose of physic may first be given to him, preparatory to

which—the day on which he takes his medicine—he should be kept on cold bran mashes; then, at night, say an hour before the last visit to the stable, his medicine should be administered to him. The motive for giving the medicine at night, is because some horses having weakly constitutions, the medicine is apt to gripe them, which, on the following day, will be perceptible, and, with this advantage, it will occur in the day time, when every horse may have attention from any quarter it may be necessary to require it. Having done this, either tie him up close, or put on a muzzle, so that he may be kept without food all night. This, on giving him a little exercise in the morning, will occasion his medicine to operate much quicker than any other way. Immediately on returning to stable, give him a handful of the best hay—first having offered him some chilled water to drink—and a bran mash slightly warmed; for, from the sickness occasioned by the medicine, horses are, sometimes, with difficulty induced to eat anything warm during the operating of the physic; but in such cases, we have invariably horned down about two quarts of gruel at intervals, which, in a short time, has restored the tone of the stomach. This treatment, with good hay, is the only food necessary till his physic is set, as it is termed—that is, done working. Were more substantial food to be given, it might lessen the effect or operation of the physic, or be thrown out whole and undigested; consequently, it is best not to give any.

Here it is requisite to caution the gentleman or the groom, to be certain that the drugs, of which the medicine is composed, are genuine and good. There is no more serious evil than giving to a horse *bad and cheap* drugs; and we have experienced this evil to a very great extent, especially in the country. When we have sent a prescription to be made up, whether it has been from ignorance of the quality of the drugs, or whether from avarice, thinking a cheap or spurious article might do for a horse, we will not pretend to say; but physic, prepared with bad materials, not only deceives and disappoints its purchaser, but may do infinite mischief, even to the extent of causing the loss of a valuable horse. Therefore, we recommend physic to be bought of such vendors as are respectable, and who prepare it in large quantities. We recommend this, because such are not so likely to have stale drugs; and also are, from experience, likely to be good judges of their quality: whilst, giving a horse-prescription to an apothecary, or country druggist, he will probably prepare it with drugs that have been years in his shop, and perhaps, originally, not of the best quality.

Every groom should be expert at giving a ball. There is an art in doing this properly, which a looker-on cannot easily discover; and, as it is a material thing to give it well, we shall here point out such particulars as may assist the young practitioner.

In giving a ball, great celerity must be used; for if it is not done quickly, it becomes disagreeable to the horse, and difficult to the operator. A balling-iron is frequently used by those who are not expert at it, and it may be best for those who are not in the habit of giving balls; but those who are accustomed to give them, will do it as well, and sooner, without this instrument.

Before attempting to give the ball, you should be certain you are tall enough to reach, should the horse raise his head. Let the person who stands on the near side, and holds the mouth of the animal open, put the ball partly into your waistcoat pocket, so much remaining out, that you can easily take hold of it when you have drawn out the tongue of the horse. Stand before him, and take the farthest hold of the tongue with the left hand, drawing as much out of the mouth as it will admit, and in such a manner as will enable you to press it against his grinders, which will effectually prevent him from shutting his mouth. Having accomplished this, fold the right hand in as small a compass as possible, holding the ball at the extreme end with the three first fingers: then put it over the root of the tongue, thrusting it as far in as you can. This done, withdraw the hand, let go the tongue, and bridle the nose in a little, to prevent the horse from coughing it up. You must now wait patiently until you see it pass down, and be very attentive, for you cannot be too certain of having seen it swallowed. If he hesitates to let it pass down, elevate his head a little, and again bridle in the nose, and that will occasion him to swallow it. Some horses will, if you are

not mindful, hold the ball at the top of the throat, till you loosen the head, and then cough it up again; or suffer it to be lodged at the extremity of the grinders, when you will perceive them chewing it, and at last ejecting it from their mouths: if the whole of this operation be not done expertly, the horse will make the more resistance. We have seen awkward persons torment the horses, and spoil several balls, before they could get one fairly down.

As much water as he will drink may now be given. Warm water will occasion the physic to operate the sooner, if he will drink it; but, as before stated, offer gruel if he refuses the tepid water. After a few hours, give water that has been standing in the stable some hours; the raw chill will then be taken off, and will not hurt him. If the physic be prepared without *calomel*, or other mercurials, which is not proper medicine for conditioning horses, on such occasions cold water should never be administered. If all goes on well, and to your wish, you must not strip his cloth off, nor dress him till his physic has done working, which generally will be about the third day. While his physic is operating, he must not be taken out, though, if it can conveniently be done, he may be put in a loose box, which will afford him exercise quite sufficient until his physic is set. Great care should be exercised in keeping his hocks, legs, and thighs clean.

When the physic has so operated as to keep the body open for about twenty-four hours, giving him copious and loose stools, you may forbear using means of promoting further operation. Let him stand until his dung is set, and then give him his corn; strip and dress him well. The next day take him out, and give him gentle exercise.

About the sixth or seventh day from the time he took his first dose, the second may be administered, ordering the horse as directed before, and again letting the same time elapse between. The third dose may then be given; and this, in general, is sufficient to thoroughly cleanse him from that faint or foul condition which green food naturally occasions. Proper diet and exercise will then get him into wind and condition for hunting: but before we proceed with that part, we shall make some further remarks on physic.

We have noticed the manner of ordering a horse in physic, under the circumstances of the medicine properly operating and achieving its end satisfactorily; but, from various causes, it may so happen that physic does not take a proper course, or effect the expected object. If physic does not operate in the space of thirty-six hours, there must be some reason for it. It may proceed from its quality, or it may arise from the ball not being completely administered; for when a ball is not adeptly given, and the horse gets part of it in his teeth, he may only swallow a part, and the residue may be dropped in his litter, and never after be discovered. It may likewise proceed from the habit or constitution of the horse not being easily moved, so that he may require a stronger dose; and some animals will keep physic longer in them than others, before it operates.

Whatever the reason may be, we should not be in haste to administer another dose until we had used the ordinary expedients, and waited to observe the effects.

When physic does not operate in the space of thirty-six hours, keep the horse warm, for that will assist the operation, and administer about a quart of gruel, into which about a pint of mild ale may be put; warm and horn it down; then in a quarter of an hour afterwards, let him be moved about at a brisk walk, or gentle trot, but not sufficiently to heat him, or in anywise make him sweat. At night, give him a moderately warm mash, into which put about a handful of ground malt; and if it does not operate by the next morning, we should then be inclined to doubt whether he had really taken the physic, unless he has appeared sick, which will be known by his being heavy and dull, and refusing his hay. On the other hand, if he has only a soft evacuation, it may be in consequence of the warm gruel or mash which has been given him. But if he throws out a copious thin stool, having been sick with it, it may be concluded that he has had all his physic, or, at least, the greater part of it; yet, if his body is not kept open four-and-twenty hours, having several copious evacuations, we may consider his physic not to be sufficiently strong, and should increase the next dose accordingly; for, in general, the first dose of physic operates the most. We

therefore increase the second a little if we think it necessary, and particularly if we do not exactly know the constitution of the horse, it being safer to under-do than to over-do it; and by the second dose we can pretty well judge what his constitution will bear, and, of course, proportion the dose accordingly.

On the other hand, it occasionally happens that physic operates too powerfully, owing to various causes, and sometimes to the constitution or habit of the horse's body. It may be that, at the time of administering physic, he is weaker than at other times; and sometimes it may be that the drugs are of a deleterious nature. In these cases, you will observe the horse only partially purge, accompanied by a kind of involuntary discharge, running down his hind quarters underneath, and all down his hocks and legs in a continuous wet and slimy kind of stream. On these occasions, the horse must be kept still, and great care taken that he does not take cold, whilst he should be wiped as dry and clean as possible. The evacuations being of a very sharp and acrimonious nature, if you find they do not abate in due course of time, proper remedies must be given, or the bowels may become so much irritated, that superpurgation may be the consequence. The best thing to give then is rice gruel, which is made in the following manner. Take a large teacup-full of rice, put it into a good-sized saucepan, and boil until the rice is perfectly soft, with two quarts of water. If the whole of the water is absorbed by the rice, put in two quarts more, and when this boils, take it off the fire, and strain it through a piece of tamis, squeezing the rice as much as you can. When this is done, break up the rice as fine as possible, and put it back into the gruel. When at a proper heat, give the horse about half, and, in about an hour, the remainder. Bran mashes must not now be given, but dry and strengthening food, if he will eat. If the first quantity of rice gruel does not have the desired effect, repeat it. This gruel may be improved by dissolving an ounce of gum-arabic to give with it, which will tend to remove the irritability, and, at the same time, strengthen the stomach, if impaired by the excessive operation of the purging medicine. When the purging has been thus excessive, we should let a clear week elapse from the time the dung was set, before we give another dose, to let the stomach and intestines recover their lost tone, occasionally administering the dissolved gum-arabic in his water, which will greatly assist that purpose. You must, consequently, be mindful that the next dose be less in quantity.

Horses having gone through their physic, you proceed, by proper exercise and diet, to get them into wind and condition for hunting. The physicking has taken between three and four weeks to get them cleansed from their soft foggy food, and now, about the same space of time is to be allowed to get the flesh firm, the coat clean, the limbs strengthened by exercise, and the wind improved by suitable management of diet. As so much pains has been taken to cleanse the body of soft and foggy food, we must now be careful that nothing but clean wholesome food should be given to the horse. For this purpose, a rack-rein and muzzle must be provided, and they must be alternately used. When the one is taken off, the other should be put on: for instance, put on the muzzle when it is expected that the horse will lie down at night. This is to prevent him from eating his litter, which some horses will do even when it is very foul. When fresh litter is given, many will prefer it to their hay: and although clean straw is not injurious to horses that are not required to gallop much, yet hunters and racers are not permitted to eat it, because it oppresses the wind. The rack-rein is an iron chain, fixed at the head of the stall, which passes through a ring sewed in front of the nose-band of the stall collar. It is fastened in the same manner as a dog's chain to the ring in the collar; and, when dressing the horse, it can, after passing it through the collar, be made to fasten him as short as may be thought proper; but, at other times, the chain must be long enough to permit the horse to feed out of his rack, or out of his manger, though not to let his head reach down to his litter.

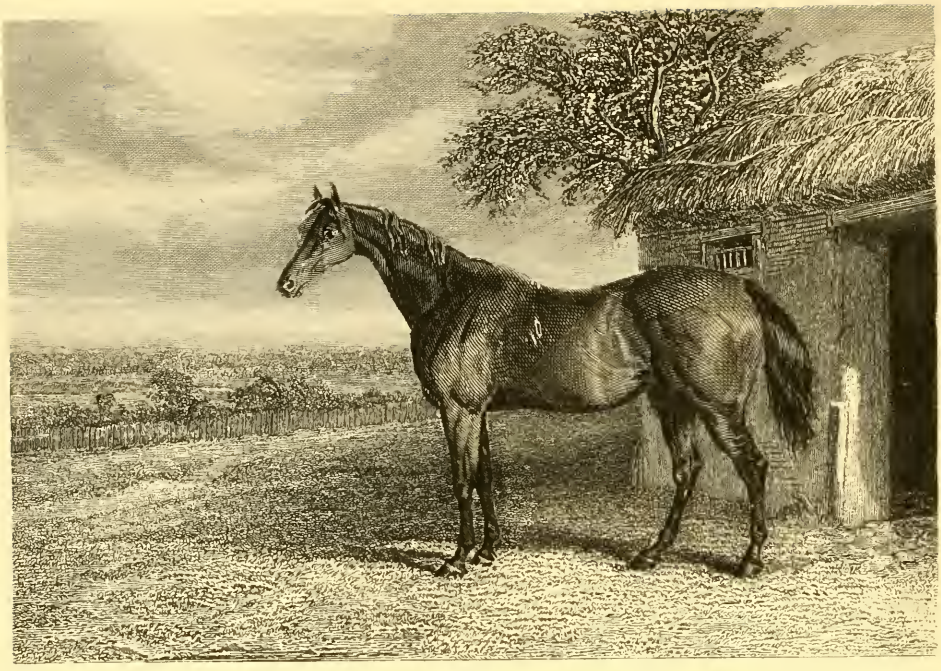
The first thing to be done in the morning, on coming to stable, is to take off the muzzle and put on the rack-rein; then throw into the manger about a quart, or a little better, of oats, according to the constitution of the horse, for some are poor feeders, and must be treated in such manner as will best invite, or occasion

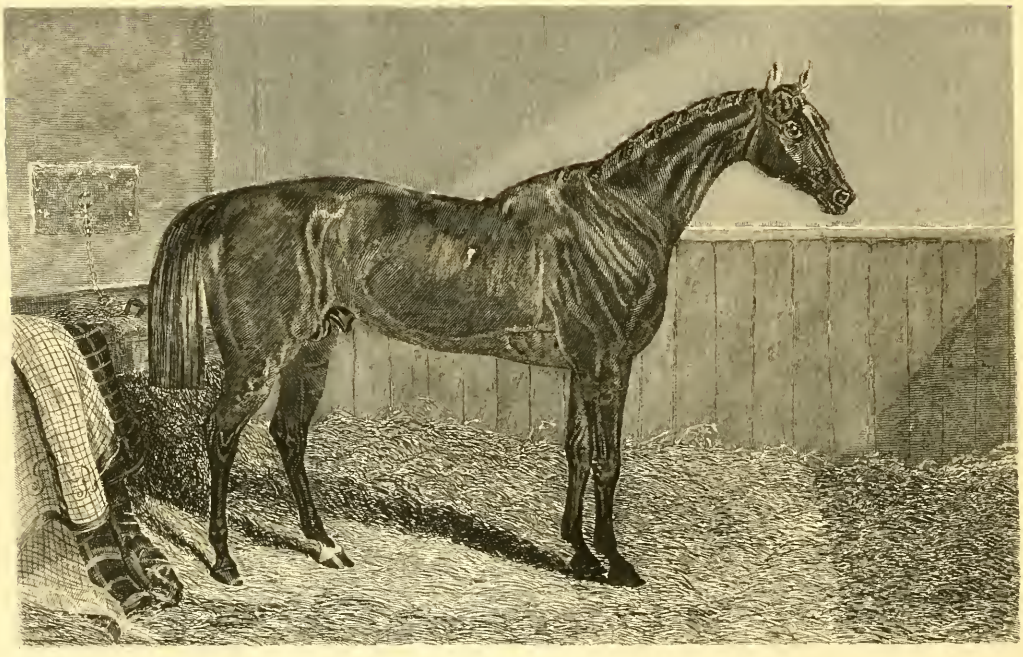
them to eat; while others, on the other hand, will eat all that is set before them, and must be stinted to a proper allowance. The oats, for these occasions, should be the best that can be procured—dry old oats, short and plump, clean from all kind of seeds, which are frequently to be found, particularly amongst foreign oats; perfectly sweet, free from dust, and white and clear. The oats should be well sifted, and the husks, chaff, or any light oats blown away, and the manger should be perfectly clean. When the horse has eaten his oats, clear his dung from behind him, but be careful not to disturb his wet litter, so as to occasion the vapour or stench to arise. You may strip off his cloths, rub the dung, if any, off his hind quarters, hocks, &c., and giving him a light brush over, put on his exercising cloth and saddle; then turn him round, brush his head and ears, put on his bridle, and take him out for exercise. The stripping and brushing are as refreshing to the horse as washing is to ones-self after getting out of bed in the morning. While the horses are out at exercise, a person should be left at home to clear away all the wet dung, immediately setting doors and windows open, in order to have the stable sweet against their return, and all the stalls set fair, and the stable cleanly swept.

For exercise, choice should be made of the driest and most open piece of turf, sod, or heath that is in the neighbourhood, and, likewise where there is some gradual ascents, if of half a mile or a mile in length all the better, to give the horses some gentle breathings, in order to bring them into wind. They should be walked the first half hour, letting them empty themselves, yawn, stretch their necks, and enjoy the sweet refreshing morning air, which is invigorating, bracing, and strengthening both to man and beast. The walks should be so managed as to bring the horses about this time to a convenient place to give them a gentle gallop; beginning slow, and gradually increasing the pace till you finish at a half or three-quarters speed. The length of the gallop should be proportioned to the strength or condition of the horse. If he is faint, so as to *sweat soon, stop in time*, and walk him, that he may recover his breath, and cool himself. He must not be put into a thorough sweat, except on those days appointed for that purpose, which should be about twice a week till he commences hunting, and then he will not require any sweating in exercise. In this manner, alternately walk and gallop, so as not to sweat him till you find it time to return, which you should so manage as to keep him out about two hours. After the conclusion of the last gallop, the horse having recovered his breath, and cool, it should be contrived to have water at hand to let him drink, and then allow him an hour's walk home. If the water should chill him, and make his coat stare, a gentle gallop to warm him will be proper, *but he must not be sweated.*

Horses generally prefer to stale on litter, as they are not then splashed by it; and if the wet litter is spread in a convenient place, without the stable—some yards are thus purposely strewed—the horses, standing a minute or two before they are put in the stable, or during the time the groom dismounts, will stale, by which means the stable will be kept clean and healthy. When put into the stable, a bit of hay, well shaken from dust and seeds, should be given. The quality of hay for hunters should be the choicest that can be procured, grown on a rich meadow, and cut before it gets too ripe. Hay, when it stands too long before it is cut, may answer the farmer's purpose by seeding his ground, and wanting less making; but to be good for a horse, and especially a hunter, it should be cut when young, before it seeds, and with the sap in it. If it is then well made, and got in, in the dry, it will, fourteen months after, cut out as green as a leek, and the flowers will retain their beauty nearly as well as when growing. Hay will never be better than when twelve or fourteen months old: but such as we have described is not always to be procured; yet good meadow hay, that has not been heated too much in the stack, may be purchased very frequently. Indeed, we have heard some experienced followers of the chase say, that they preferred it a little brown; but, if it is twelve months old, having a fragrant sweet smell, it cannot be too green. New hay must not, on any account, be given. We give this caution because of the faintness which is in new hay, and which will be as detrimental as giving him grass; that is to say, if it is meant to preserve the horse in good hunting condition.

Having put the horse to the rack-rein with





a bit of hay before him, whisp his legs, for these ought always to be the first and last things attended to, and particularly after physic; then strip his clothing *half off;* that is, to about the middle of the back, and give the fore-quarters a good thorough dressing. This being done, get dry clothing, and place on the parts cleaned, slip off the exercising cloths, and dress well his hind-quarters. This being done, remove the clothing from his fore-quarters, and brush him well over, agreeably to the manner we have before directed. After this, give his feed of oats, being double the quantity, or nearly so, to what was given before going out; then having whisped his legs as the last thing, shake up his litter, and set the stable fair; if he has cleaned the rack of the hay—for it is best to give but little at a time, that he may eat it with better appetite—you may give a bit more, if you think it necessary, *but never give more than he will clear with a good appetite.*

Having been up at the stable and out at exercise since five o'clock at this season of the year, it will now be high time to breakfast. Leave, therefore, the hunters on the rack-rein, while you are discussing your morning repast, and they will finish their hay.

On returning to the stable, observe that all have cleared their racks. If they have had sufficient time, and the racks not clear, take the hay away, loosen the rack-reins, put on the muzzles, and leave them for three hours quiet, that they may lie down if they are so disposed. It is a desirable thing for horses to rest their legs at all convenient opportunities.

This will bring you to what is termed middle day, or it may be one o'clock; for, as the days at this season are beginning to get shorter, you must be at the stable as punctual as the clock, so that you may contrive to be at home from exercise before dark. You should proceed now, in like manner, as in the morning, putting on the rack-rein, giving them a mouthful of hay, and a feed of oats in moderation; for they are not to be filled or incumbered with food, particularly hay, when they are going to be taken out. While the horses are feeding, clear the dung from behind them, as in the morning; then strip and brush them over previous to putting on their exercising cloths and saddles, and take them out, as in the morning. If you are situated in a country that affords a variety of suitable places for exercise, vary these as often as convenient. This will be the more agreeable to both horse and man. Keep off the gravel roads, choosing to go on the turf as much as possible. Having been out about two hours, in which time you have given the horses two gentle breathings, let them have water, and return.

The stable, as before, in your absence, should be cleared of all wet litter, and aired and refreshed against your return. After giving the horses the opportunity to stale, bring them into the stable, and repeat the rubbing of their legs, thoroughly dressing them, having, at the same time, given them a mouthful of hay to amuse them. After dressing, give them a feed of oats, and a bit more hay, if they have cleared the rack of what they had at coming in. This will bring you to about five o'clock in the afternoon, at which time you may leave them on the rack-rein to eat their hay; and between seven and eight return to finish up for the night. If a sufficiency was given them at leaving stable at five o'clock, they will need no more, the horses having had three hours to take their hay. If a horse is a slow feeder, he ought to have cleared his rack by this time; and such horses as have not done this, should have it taken from them; for the horse that is glutted with hay will not have any appetite for it; and as it is always standing by him, you should be mindful not to give too much, so as to occasion him to leave any. You have now to feed with oats for the last feed; see that all their cloths are put on right, not atwist, but smooth, and without a wrinkle about them, and that every horse finishes his corn, not leaving any; then loosen the rack-rein, put on the muzzle, and make up a good bed. Having plenty of dry litter, and a large stall to lay his legs out at full length, leave him for the night.

This is the daily duty of the hunting stable, without any material difference, except on the days appropriated for sweating, which must be, at least, two in the week, till the hunting commences. When this takes place, and if the horse be hunted twice in the week, there will be no occasion for sweating exercise.

We would not recommend hunters to be kept over-warm with cloths. They are frequently exposed to cold and wet; and the more tender they are kept, the more likely they are

to take cold; therefore, hoods and fillet-cloths may be dispensed with; but we think it highly necessary that each horse should have two cloths—one for exercise, which will occasionally be brought home wet and dirty; the other for putting on in the stable. The cloths should be occasionally scoured; and the exercising cloth, as often as it gets damp by rain, sweat, or dirt, carefully dried.

On the days for giving the horses sweating exercise, which may be on Tuesdays and Saturdays, or any other days equally distant, contrive that the sweats may be given as contiguous to home as possible, particularly if the air is thin and piercing. The object of this is to enable you to get home in good time for the purpose of scraping and rubbing them dry. When a horse is in a thorough sweat, and a chilling air penetrating under a wet cloth, he is almost sure to take cold, cough, &c.; therefore, the stable or rubbing-house should be conveniently at hand to prevent such a circumstance from occurring.

After having walked the animal for about an hour, bring him to the place where it is intended to gallop him, and begin very moderately, gradually increasing his speed till it attains to half or three-quarters, if he is hard to sweat. Continue him at that rate until he is in a proper perspiration, which will be sooner or later, according to his state. If he is fleshy and foggy, he will perspire soon, and his wind will be distressed. In this case, he must be galloped the slower, not to distress his wind, but to make him sweat, which will reduce his fat, and bring him into wind as that diminishes. If the horse is in good wind, and hard to sweat, his condition is improving, and stronger gallops may be given him without injury. The object and intention of these sweats are, to those that are in wind, to keep them so; and to those that are not in wind, by strong exercise, to get them into that desirable condition, by reducing all grossness arising from too much fat. The exercise, likewise, cleanses the coat, and makes it sleek and soft; for the imperceptible perspiration continually going on, adheres so closely to the roots of the hair or coat, that it is not easily got out; but these profuse sweatings bring it away, when, if the coat is well dressed after a good sweating, it becomes much finer.

The condition of the horse is to be discovered and judged of by his sweating. If he perspires soon, and puts on the appearance of soap lather, he is then what is called foggy, and must have strong exercise to carry it off. If he requires strong exercise to bring him to a sweat, and the sweat is clear like water, and dries soon, he is then in good condition, and fit for immediate work; but if he perspires profusely with little exertion, and it is thin, though like water, and he is a long time drying, it shows a weak, faint habit of body. Indeed, we may call it a bad constitution, that will not bear much work, especially as a hunter. Some horses sweat more profusely than others. This, however, is not always to be regarded as weakness, if it proceeds from strong exercise, and soon dries. Constitutions differ in horses as much as in men.

The horse having had his sweating gallop, should be brought into the stable, and well scraped and rubbed dry, with all possible dispatch. A clean dry cloth—not the one he has been sweated in—should be put upon him, and should be made clean against its being required again. If he had no water while out, give him some after he is perfectly cool and comfortable; and if the weather is cold, the chill should be taken off, but it need not be made warm. Water that has stood several hours in a warm stable, is sufficiently chilled, and may be given; or, after rubbing him, he may be walked about, and water given, and a gentle gallop taken, to warm him, but not to heat him. Then he should be brought home.

A horse treated in this manner will, in three or four weeks, after having been through his physic, be fit for hunting, if proper regard is paid to his feeding. His food should be of the best and cleanest quality, and the quantity should be regulated according to circumstances; such as size, constitution, &c., &c. Having arrived at this stage, the daily exercise of the horse will now be, on the average, not less than twenty miles a day. With this exercise, the quantity he eats will not hurt him, if he does not get too fat; for the hunter must have plenty of good feed, but must not be burthened with flesh. If he feeds heartily, he must have strong exercise to keep his flesh down. If inclined to run to belly and be fat, he must be stinted proportionably, or occa-

sionally given alterative medicine; but when he comes to hunt three times a week, there will be no necessity to stint him, and he will never be burthened with flesh with such exercise.

The horse being got into condition, and the hunting season commenced, the sweating process ceases, and instead of giving exercise, to keep his flesh down, and preserve his wind, the exercise is now for the purpose of walking off stiffness, occasioned by over-exertion; bracing the system which may have been relaxed by excessive work, and creating an appetite. Hard running and long distances, continued for many hours, will affect a horse more or less, particularly at the beginning of the season, before he is accustomed to it, so that his appetite will fail as well as his limbs become stiff. Attention must, therefore, be turned towards recovering him from that debility which is caused by over-fatigue.

Young horses, and such as are not seasoned for hunting, though in condition, are mostly affected by severe days. These, therefore, must not be expected to hunt more than one day in the week; for it will take nearly the rest of the week for them to recover from a hard run, either with fox or stag. Seasoned hunters, however, will stand their work twice, and, in many cases, three times a week; though, for a continuance, this is too much for any horse, unless it is with harriers only, where there is seldom much hard running.

To order the horses well when they hunt, feed and dress them much after the same manner as before directed; only, when going out in the morning, *rather shorten their allowance of hay* in the evening, and *increase their corn*, but do not gorge them. They should always have a good bed to invite them to lie down, and stretch their legs; but the muzzles must be kept on; for, though many do not constantly use these, yet, if they be used at all, this is the most proper time to do it. In the morning the horse should be put on the rack-rein, but hay should not be given him. This we would recommend for constant practice; and if it is made a rule not to give him hay until he comes home from exercise, he will not pine, or look or long for it. If the distance is considerable where the hounds are to meet, or if the covert be twelve or more miles distance, the horse may have a moderate feed of oats. Let him be thoroughly cleaned, his legs well rubbed, and his saddle put on, moderately girthed, at least an hour before going out. This will cause him to empty himself; for most horses, when the saddle is put on, relieve themselves by dunging if they can. A quarter of an hour before wanted, put on his bridle, and have him ready, buckling him to the stall-reins. Let him stand till wanted, with a cloth thrown over the saddle.

When a horse returns from hunting, it necessarily follows that all expedition should be used to get him clean, and made to feel comfortable. If there has been very hard running, and he comes home leg-weary and tired, cleaning will be more refreshing than feeding, and therefore must be first attended to. He may have a sweet bit of choice hay put into his rack to amuse him, if he will eat while he is dressing; but when it has been a long day, and hard riding, many animals will be off their feed, particularly young and unseasoned horses. This, as a matter of course, is to be expected, though it is most desired that they should feed, which is a sign of a constitution for extraordinary labour. On the hounds being drawn off, and the day's hunt finished, the horse should be thoroughly cleaned. His head and ears should be particularly well rubbed, and his body made perfectly dry in every part. He should be minutely examined to see that he has received no injuries from stakes, stumps, boughs, brambles, thorns, rails, flints, &c.; likewise, that he has not been galled with the saddle, girths, or breast-plate, if he has worn one. When he has been refreshed with a thorough good cleaning, he will be more inclined to feed than before; but if he will not, his appetite will come as his weariness wears off.

On returning home from hunting, it is usual to let the horse drink—for he is sure to be thirsty—at some convenient pond. But he should not be suffered to drink too much at a time. About ten go-downs will be sufficient, till he is ridden to another convenient place, where he may be allowed to have the like quantity, and thus by degrees he will quench his thirst before he gets home, which will be better than letting him drink a vast quantity of cold water at once. Should an opportunity not have been had of giving him water on the way home, he must, on his return, have it with the chill off; and what is even better than this,

a bucket of chilled water, but not warm, into which about a handful of oatmeal should be thrown. When his thirst has been partly quenched he will probably eat.

The legs, from excessive labour will, of course, be weary, and often inclined to heat and inflammation, particularly if the horse has been ridden among brambles, thorns, or furze. The greatest attention must, therefore, be paid to them. *Hot water* should always be ready against his being brought in from hunting, for the purpose of washing his legs; for nothing is more grateful and refreshing to these members, when they burn with heat and weariness, than soaking them well in hot water. It opens the pores of the skin, and draws out the heat. Let the water be hot, and bathe the legs well with it, having two pieces of woollen cloth, one to remain in the water, whilst the other is being used, so that by alternately changing them the leg will be kept constantly warm. Apply these well round the fetlock, joints, and pasterns. Do this for at least three-quarters of an hour; after which wipe them as dry as possible with a sponge; then carefully feel with your hands for any brambles or thorns that may be lodged in the skin; for the hand may now discover what the eye cannot perceive. Whatever may be found of this kind, must be picked out with care, so as not to enlarge the apertures they themselves have made, nor break or leave any part of them in. Much care, therefore, is necessary in extracting these foreign bodies; for they frequently produce a blemish, from the scab or scratch they occasion, by which the value of the horse is greatly deteriorated.

In some instances we have known thorns to penetrate so deep as to break within the skin; and, if such are not discovered, which it is sometimes difficult to do, an abscess will form. If this should be the case, immediately on discovering it, take linseed meal, four ounces, common turpentine, one ounce: mix well together with scalding water, and apply warm to the part affected, in the shape of poultice. This, in all probability, will draw out the offending particle; after which it must be dressed, as a common wound, with tincture of myrrh and aloes, three or four times a day.

A case of the above kind occurred with a valuable horse, when the village farrier was sent for. This professor opened the tumour on the top or upper part, the consequence of which was that there was little or no discharge. He then introduced a piece of tow saturated with butter of antimony; the consequence of which was a wound of an amazing extent. The veterinary surgeon was then sent for, when a few days' poulticing, accompanied with cooling medicine, produced a healing process; but the horse had always a blemish. Being a well-known good hunter, however, this did not take so much off his value as might have been expected. Had the stupid fellow punctured below, instead of above the abscess, it would have relieved itself, and prevented the blemish, and, of course, the disagreeable eye-sore.

We mention this, in order to show the necessity of carefully examining for thorns. Should a similar circumstance happen, take a *middling-sized abscess lancet*, and open the abscess at the bottom. By this means the accumulated pus will discharge itself. Then treat as above. Apply a bandage round the part, which will keep the lips of the wound together, and accelerate the healing of it.

Having carefully searched, and extracted brambles or thorns, whisp and wipe the legs perfectly dry. After this, and after the animal has had his water, if he will not feed, it is most likely for the best. Extraordinary exertion, perhaps, more than he has been seasoned to, may have caused an inward or sympathetic fever; and, until he has had rest, free circulation of air, and a little cooling medicine, the appetite will not return. In such a case give—Barbadoes aloes, one drachm; ginger, two drachms, formed into a ball, with half an ounce of common soap. Give this to the horse if his appetite has not returned by the morning after the chase. Some persons make themselves very uneasy on such occasions; and many are for giving a warm mash, which, of all things, the horse will not eat. Others are for giving a cordial ball, or something comfortable in the shape of a warm drink, all of which is of no use whatever. We recommend patience until the morrow; and if it should be deemed necessary, repeat the medicine. If nothing of a dangerous tendency exhibits itself, such as inflammation of the lungs, &c., make him up a good bed, and leave him to rest.

In the morning, the horse will, in all probability, feed a little; you must then proceed as

before directed, and take him out to exercise; after which, take linseed meal, two ounces, glauber salt, two ounces, warm water, three pints; give this drink the moment he comes in from exercise, and in the course of two days the horse will be fit for work again. Keep giving him sufficient exercise to take off that stiffness which naturally occurs from extraordinary exertion; and the fresh air will greatly contribute to recover his lost appetite.

Though we term this walking exercise, we do not mean that you are not to exceed a walk the whole time you are out. What we mean is to give the animal such exercise as will put the blood in free circulation without overheating it. A gentle gallop, therefore, may be given him for a short distance, but not such as will cause him to break out in a sweat, particularly after giving water: gallop by way of warming it. Choose the airiest place for exercise, such as open downs, or high and dry grounds; and when you return to stable, the horse, if he has not been very sick indeed, will have found his appetite.

Horses that become weary, and sicken at a day's hunt—which may be the case with even good animals, at the commencement of the season, or young horses, till they get properly seasoned to their work—will require some days to recover before they are fit to hunt again. A week's respite may be necessary with some; others will recover in half the time. The sooner the horse comes to his appetite, the sooner he will be fit for labour, provided he has not been nursed with *warm mashes and comfortable drinks, as they are termed*, which have a tendency to relax and open the body, and should only be given when he is in reality ill; but loss of appetite from over-fatigue only requires rest to be restored; therefore, avoid all the nostrums of the stable; which we are sorry, in too many instances, abound.

With regard to heat, or inflammation from the saddle or girths, washing the parts with goulard, is, perhaps, the best thing that can be done; and to the legs, if hot and swollen with fatigue, is the best repellant and cooler, and should be always kept ready at hand for such occasions. To prepare it, get a quart bottle, and take—extract of lead, 4 drachms; water sufficient to fill the bottle. The stable should never be without this lotion. It is cheap, efficacious, and ought always to be at hand. Washing the legs—which may have received scratches, &c., in hunting—with it, will heal them quicker than any other application.

The feet are likewise to be attended to at all times. On the horse's return home, all road-dirt, or gravel, should be carefully picked out; and particular care should be taken that no gravel is lodged under the shoe at the heels and quarters, as by such lodgment, *corn* may be produced, with all its natural consequences of tenderness and lameness. When the legs are washed with warm water to cool and refresh them, it will, at the same time, be well to relieve with it the feet, which must have undergone a considerable quantity of labour. Water is very beneficial to the feet, which are less injured by travelling on wet roads than on dry ones; and the hoof at grass, being continually wet with the dew and moist ground, is in a better state than when kept in the stable. The casual wet met with in exercise on the roads, or the moisture of the turf or grass, where exercise is given, will contribute to preserve the feet from the injury which continually standing in a hot and dry stable occasions. It is, perhaps, not too much to say, that one-half of the pleasure-horses kept in London, incur lameness, and are ruined by standing so much in the stable.

Training the hunter is a simple process, all that is required being to bring him into good wind, without, at the same time, reducing him too low in flesh, or injuring his sinews; since, on a long chase, more especially over a heavy country, a horse needs the aid of his full bodily strength, and of his unimpaired tendinous and muscular powers. It is extremely dangerous to ride over the country, a horse which is weak in his joints, or has the common hurt in his back sinews; but the danger is tenfold in taking a flying leap upon such an animal where the opposite descent is considerable, and the stress upon his lower limbs in his landing, with a heavy weight upon his back, must be excessive. Training must commence with two or three doses of physic should the horse be gross, and not have been previously trained. A young horse, in his first training, will require most work; but it is better rather to under-do than exceed in this, because if a horse come into the field rather

under-worked, being full of good meat and heart, the easy remedy is to favour and ride him carefully the first week or two; but should the training groom set you upon him harassed and weakened by too much exercise, he will get worse as the season advances, and, perhaps, be totally ruined by the end; exclusive of the risk of failing in a long and important day. Old hunters from spring grass, which they ever ought to enjoy, can scarcely be trained too lightly. The true test is, to see that their wind in its course is free and unembarrassed. To this point, however, their exercise must at any rate extend. The lighter the horse's clothing the better, in view of the heats and colds he must necessarily undergo in the chase. An early morning's gallop, at a good steady stride, but not speedy, of a mile or two, with a canter after water in the afternoon, is sufficient for the hunter, and two months ought to bring him into good condition. A young horse may have, once a week, a tolerably sharp rally for one or two miles, a method which should never be practised with a seasoned hunter; to which, indeed, walking exercise may be often substituted for the gallop.

Some think that even the simple process now described is not necessary, and that horses that are taken up and worked in the day, and with a feed or two of corn, and turned out at night, with an open stable or shed to run into if they please, are as active, healthy, and enduring, as those which are most carefully trained, and confined to the stable during the hunting season. Many a farmer has boasted that he could beat the most numerous and the best appointed field, and that his horse never wanted wind, and rarely tired.

It is true that the farmer may enjoy a good day's sport on the animal that carries him to market, or possibly, occasionally performs more menial drudgery; but the frothy lather with which such a horse is covered, in the early part of the day, unmistakeably evinces his inferiority. There is, however, one point in which the untrained horse has the advantage. Accustomed to all weathers, he rarely suffers, when, after a sharp burst, there comes a sudden check, whilst the pampered and shivering stabled horse is exposed with him for a considerable time to a piercing north-easter. The one cares nothing about it; the other may carry home the seeds of dangerous disease.

TRIMMING.

Many gentlemen attached to their horses, are sometimes fond of trimming them. This operation frequently fills up a leisure hour in the morning, and there is a self-gratification in being able to perform it without the assistance of any one. We have known some gentlemen so celebrated for squaring a horse's tail, that they have frequently been invited to perform that operation for many distant friends; consequently it will not be out of place to introduce the method of performing this operation in the most gentlemanly and skilful manner.

Trimming is one of the principal duties in the business of a groom, and every one who has the care of horses, should qualify himself to perform it, as it is allowed to set off an animal to much advantage. Many horses are exceedingly troublesome to trim, and, in order to accomplish it, require most extraordinary means to be adopted. We have known large sums of money given for trimming such troublesome horses. We are of opinion that the animals become so from the improper methods taken with them at first, by those who had not patience to coax, nor ability to accomplish by compulsion, and therefore employed such means as made the horse desperate, without being able to effect their purpose. Most horses have such a dislike to be trimmed, particularly about the head, that few stand without the twitch; and if they stand tolerably quiet with that, it is as much as can be expected; but if, with a little coaxing, it can be done without the twitch, it will be the better. There is great care, skill, and judgment required in trimming: care, that you do no injury, by the unsteadiness of the horse, with your scissors; skill, that you may not disfigure him by scoring, notching, and the like; and judgment to trim him in such a style as will be most proper and advantageous to his appearance.

Begin at the head—first, with the foretop, and clip close and smooth only that part on the forehead which is in the way of the front of the bridal and stall-collar. Next clip away that

part on the poll, where the head-stall of the bridle, or stall-collar comes, taking care to remove as little towards the neck as possible; or, if the animal is clipped beyond where the head-stall of the bridle comes, it will disfigure the neck. The next point is to trim out the ear, which will be found a little difficult to do; and few horses will stand quiet to have it done without being pinched with the twitch.

The scissors most handy for trimming ears, are such as are narrow in the blades, the points not too sharp, but well cut. Begin with clipping the inner part of the ear, going not too near the edges, till the long hair on the inside is cleared out; then gradually approach the edges, drawing the outside skin of the ear back, so as not to clip so close as to leave the edge of the ear bare, and thereby disfigure it. The outside skin of this organ is very loose; and as it is held with the left hand, while being clipped with the right, it is apt to be drawn so far forward as to deceive the operator, by making him clip too near the edge. Care must therefore be taken that no notches or scallops appear on this part. Having clipped to the edges, and no farther, the outside hair will stand projecting beyond these, quite even and regular if the operation has been properly done.

At the bur and root of the ear, a quantity of long flossy hair grows, which must be partly clipped away, and that on the inside must not be left in scores and notches. You finish with the scissors, by clipping the hair that projects round the edge of the ear, cutting it all round, so as to preserve the exact beauty and shape of the organ, leaving, to be singed at the root, a quantity of hair which the scissors would only score.

All superfluous hair about the face and beard, under the eyes, and about the nose and lips, should be clipped as closely as possible. Rough horses, lately come from grass, and coarse-bred ones, have a quantity of unnecessary hair growing very thick under the throp-ple, and about the throat. This must be removed.

The fore-legs are the next parts to be handled, and great pains should be taken with them. Thorough-bred animals, kept in the stable, and properly groomed, seldom require trimming about these members, as all superfluous hair rubs off with their dressings. When lately taken in from grass, however, a little long hair will appear on the back sinews, and on the fetlock-joints, which may be taken off, by using a small quantity of powdered resin, say as much as may be taken up between the finger and thumb; and this will remove it with as much ease to the horse, as facility to the person trimming. Let the compressed hairs be cut to any length, provided no ridges will be seen; and if properly done, it will scarcely be perceived that it has been touched. The coarser the breed of the animal, the more useless hair will be found on the legs, and within the pastern. Where it is abundant, it must be removed with the scissors, beginning next to the heel. Clip it clean out within the pastern, and under the fetlock-joint. The adjoining part will then be able to be so nicely tapered, that the sudden break from short to long will not appear, which otherwise would be the case. The soft spongy piece of flesh at the back extremity of the pastern-joints, can be pared down, if necessary, with a sharp knife, and the portions above left in such a manner as to resemble the legs of a thorough-bred horse. The hair, up the back sinews, must be raised with the comb, and cut in equal lengths, tapering it towards the sinew, in such a way as to prevent the appearance of all scores or ridges, allowing that portion next to the back sinews to be the shortest.

As there are some horses a little bent at the knee, the hair, within that joint, should not be clipped too close, as it will make that defect appear more conspicuous, and defeat the object of trimming, which is to make the animal appear to more advantage than belonged to it before the operation was put in practice. Care must, therefore, be taken to conceal as many of the defects as exist. Where the legs are straight, however, all the flossy hair within that joint may be removed. Round the coronet of the hoofs the hair should be clipped regular and even. The four legs being thus trimmed, there only remains the tail for the further operation of the scissors; for the mane, unless it is what is called hogged, must not be touched with that instrument.

As fashion and fancy are ever wavering, the tail and ears have always been subject to such changes as are agreeable to the taste of the

times. At one period, a switch tail; at another; a full bushy tail; then a blood tail; then another; and then again a short switch tail, about a foot and a-half long. This being the case, it may here be as well to make a few remarks upon them separately and individually.

The switch tail requires no cutting; the long hair being left on it after the end of the dock is broken off, is pulled underneath, and at the sides, with an iron instrument, made for the purpose—but now seldom to be seen, except in the carter's stables—till it is tapered to a point, leaving only about eight inches below the dock.

There is much reason in this sort of tail, seeing that nature designed this appendage to strike the flies from the bodies of such animals as are possessed of one. Man, however, to accommodate himself, denudes the brute of its natural property, simply because the tail annoys him when it is switched about in hot or dirty weather, thus depriving the animal of that which was intended for its own especial comfort.

The bushy tail is permitted, to preserve all the hair that grows upon it. Holding the tail to that elevation in which the animal usually carries it, the scissors are employed to cut in a perpendicular direction, within about half an inch of the end of the dock. There is much art and ingenuity in cutting tails of this kind perfectly square, leaving both sides of equal length, and permitting no projections or hollows at the end.

The brush-tail was formerly deemed suitable to such horses as were well nicked, and carried it high, and bent upwards. A tail of this kind was rounded in such a manner, that, when it was up, it resembled the hair of a brush. Much ingenuity is required to cut it true and even.

The blood tail has been in vogue for many years, and is perhaps the most becoming of any. It requires the least art or ingenuity in cutting. The hair has only to be combed out and held together with the left hand, when the ends are cut off square, at a proper length, generally about three inches below the end of the dock. After this it is combed out, and any irregularities that may appear are taken away. The hair of the blood horse's tail is generally thin, and of an easy flowing nature; and having always a becoming appearance, is, as we have said, greatly in fashion.

The thin tail is a mean representation of the blood tail; and tails of half or inferior bred horses, are fuller and more bushy than those of blood animals. Hence, to bring these to some resemblance of the blood tail, the under hair is plucked to thin it, and by such means they are made to appear like a thin ragged tail. The ends are squared in the same manner as blood tails are done.

Thin-tailed horses have, in general, been remarked to be good ones. But the difference between them and blood animals is easily discovered; and for this reason should, perhaps, be more properly denominated ragged-tailed.

After all these operations, which we have so minutely described, there only remains for the mane to be pulled and singed. To do this, first, comb it thoroughly, laying it very smooth and even. Then begin at the top, and taking hold of a few of the longest hairs at the points with the right hand, separate them from the other hair, by moving the comb in an upward direction. If you have hold of no more than would be about the thickness of a straw, twist the hair round the back of the comb, and pluck it out. Continue to act in like manner till that part is reduced to the thinness and length desired. Proceed in the same way down the mane, making all alike, and repeatedly combing it out. Hairs left longer than the rest must be plucked, not cut. The fore-top is a great ornament, and should be left long, so that it will tuck under the bridle, and reach three or four inches below. The extreme ragged points may be taken off with the scissors, so that the mane may be left thin at the points. It is not to be squared, however, so as to look thick and bushy. Singeing now finishes the operation of trimming. Rough horses, newly taken from grass, usually require a good deal of singeing all over, they having long downy hair projecting beyond the rest of their coats.

For the purpose of singeing, a candle with a large wick is required, and the head is the first part to commence with. The long downy hair which projects beyond the rest, may be singed to a level with the coat. The outside of the ears will have some; and there will be much at the bur of these. The candle must not be kept long in one place, or it may burn the animal; therefore, where there is much singeing required, it is better to rub the singed part, to

let it cool, and apply the candle again. Take care, however, not to continue this so long as to blister the skin. The places which want the most singeing, are at the root of the ears, the thropple, about the throat, and the adjoining part of the neck. Put the hand now over the eyes, and singe all the light straggling hairs perceived about them and the brows, forehead, cheeks, beard, and the like. The thropple and throat require many repetitions, the hair being so abundant and thick, that it is extremely necessary that frequent wipings be resorted to, to see that the singeing has not been performed irregularly.

The head and throat being operated upon, and finished, with a candle, the remaining parts of the body are to be singed with straw. For this purpose, take as much long clean straw at a time as has about the thickness of three fingers, and lighting one end, begin at the neck, and pass the flame from one part to another. Great care must be taken not to singe the mane; proceeding thence to the chest, shoulders, breast, and every part where long and downy hair is perceived projecting beyond the general coat, being cautious not to make the blaze too large, or continue it too long in one place, particularly where there is but little hair, as under the flank, and within the thighs, &c. Then giving the horse a good wiping, and brushing over completely, the trimming is finished.

We may observe, that horses which have been kept for a time in the stable, and properly groomed, have not those long downy coats, and consequently do not require singeing all over the body. The beard, the ears, mane, and the tail, are generally all that a blood animal requires to be trimmed when he is kept in the stable. Coarser animals, however, require the heels and other parts to be trimmed, though the coat may be kept in such a state as not to stand in need of it. We have observed that some horses are troublesome to trim. The means usually adopted, in addition to the twitch on the nose, or sometimes on the ear, are those of the gag with the halter, put through the mouth, and over the ear: the more that horses struggle with these appliances, the more they gag and pinch themselves.

To keep the legs still, while trimming, a person should be employed to hold up one while the other is undergoing the operation. If a hind leg, a side-line may be put on to draw up the other, which is not being trimmed. These are the usual expedients, but they ought only to be put in practice when the horse cannot be coaxed to stand without them.

An abundance of litter in the stall is advisable, as it may prevent accidents in the event of the horse struggling hard whilst undergoing the operation.

FOOD.

In regulating the food of a horse, the first points to be attended to are quality and quantity, which ought to be proportioned to his habit of body or constitution, and the nature of his work. If the quality is bad, it will make him foul, and will not afford the same degree of nutriment that clean wholesome food will yield: if he is fed too plentifully for the work or exercise he has, it will make him too fleshy and gross, and probably do him material injury. Again, if a disproportionate quantity of hay is given, it will cause him to drink too freely; blowing him out with a description of food which affords the least nutriment. A horse thus fed cannot endure much labour, and his wind becomes distressed.

Hay, however, is the natural food for horses, but is not sufficiently strengthening for them to work upon now-a-days; therefore, to be kept in condition, they must be fed sparingly with it, although it be of the very best quality. The quantity necessary for a horse depends much on his size, constitution, and the nature of the work he has to perform. Hence, if he is put to fast work, his food should be of that quality that affords the most nutriment, that lies in the smallest compass, and requires the least water to digest it. When these are attended to, his wind will be the least distressed. If his work is hard, that is, continued for several hours, but not at any extraordinary speed, he may have a greater quantity of hay, and even of beans with his oats. Chaff, if sweet and good, is proper for some animals that have thin light carcases, and not worked hard. Such as eat their corn greedily without masticating it, and scatter it among their litter, should have a handful or two of good sweet clover chaff, which will be infinitely

serviceable, as it will oblige them to chew or masticate their oats with the chaff before they can swallow it. But though chaff is filling, it must BE *sparingly* given, as it fills them up, and inclines them to drink much, when they will appear plump and fair, *but not be in condition for work.* It is most proper for slow draught horses.

The quantity of hay necessary for a saddle-horse, is from eight to sixteen pounds *per* day, according to size, constitution, and his work. About twelve pounds will be found generally sufficient; but large carriage horses require from sixteen to twenty pounds. If horses get lank and hollow in the flank and quarters, their allowance should be increased; but, on the contrary, and for the sake of having them fat and plump, they must not be supplied with too much hay and water. An animal when fat, is less fit for work than when lean, provided his leanness is not occasioned by starvation, for he may be rendered poor by his work exceeding his keep. If a horse is stinted to an allowance that keeps him in tolerable condition with only a little walking exercise, and then put to work without an increase of food, he will, of course, become thin; but if not given so much work as to exhaust his strength, as well as his flesh, he will be nothing the worse for it. Increase his food, and he will be better for work than before.

Oats of quality are the most nutritious food for saddle-horses, when given in proper quantities; say three-quarters per day, provided his work is no more than exercise; but if the horse is kept to constant hard work, he is in no danger of being over-fed if he has as much as he can eat. The qualities of oats will be discussed further on.

Beans are excellent and stimulating for hard-worked animals; but of their properties we shall speak under their own specific headings. Here, however, we may observe that the small and plump bean is usually the best, by all means, for such horses as are either lightly worked or required to go at speed, as they need more water to digest them, and swell in the stomach. They may, however, be allowed to animals that travel at a moderate rate, or such as are employed in draught work. They are also good for coach or omnibus horses if given in small quantities.

Water is usually given twice a day; some, however, give it three times; but this plan of watering does not do so well for travelling as for draught horses. Soft water is esteemed preferable to hard spring water; hence rivers and running streams, or such springs as supply ponds, where the water gets impregnated and softened by a loomy or chalky soil, is better than hard spring pump water. The quantity in this, as in food, must also be regulated by circumstances, size of horse, constitution, &c. Some animals will not drink immoderately, and may safely be left to their discretion; while others, if permitted, will swill, and render themselves incapable of work, by causing immoderate perspiration and distress of wind. When the work is done for the day, a reasonable quantity may be allowed. Half a stable-pailful of water is generally sufficient for the morning.

MANGER-FEEDING.

The system of manger-feeding which has now, for some years, been adopted on the road, arose no doubt from a desire in the proprietors of horses to fill the stomachs of their animals in the shortest possible space of time, in order that they might get more rest on the road; and among farmers it is becoming more general. It is certainly well adapted for horses not overworked through speed; whilst it is an economical way of feeding, as by mixing a portion of chaff with the corn and beans, the animal is compelled to chew his food. He cannot bolt the straw or hay; and while forced to grind the chaff, he also grinds the oats and beans. By the adoption of this plan more nourishment is yielded, and the stomach is more slowly filled. Independently of this, the increased quantity of saliva thrown out in the lengthened grinding operation softens the food, and renders it better fitted for digestion.

Chaff may be composed of equal quantities of clover or meadow hay, and wheaten, oaten, or barley straw, cut into pieces of a quarter or half an inch in length, and mixed well together; the quantity of oats or beans is afterwards added, and mixed with it. The beans and oats should be bruised, because the whole oat is apt to slip out of the chaff and be lost; but when it is bruised, and especially if the chaff is a little wetted, this will be less likely

to occur; and even if a portion of it escape the grinders, it will be partly prepared for digestion by the act of bruising. The prejudice against bruising the oats is, in so far as regards the slow draught horse, entirely unfounded. The quantity of straw in the chaff will always be sufficient to counteract any supposed purgative quality in the bruised oats. Animals of quicker draught, unless they are naturally disposed to scour, will thrive better with bruised than with whole oats; inasmuch as a greater quantity of nutriment will be extracted from the food, and it will be easy to proportion the quantity of straw or beans necessary to counteract any mischievous consequences to the bowels of the horse. The principal alteration that should be made in the diet of the post or stage-coach horse, should be to increase the quantity of hay, and diminish that of the straw. Two trusses of hay may be cut with one of straw. It is remarked by Professor Stewart, that "many horses swallow their corn in great haste; and when much is eaten, that habit is exceedingly dangerous. The stomach is filled —it is overloaded before it has time to make preparation for acting on its contents—the food ferments, and painful or dangerous colic ensues. By adding chaff to his corn, the horse must take more time to eat it, and time is given for the commencement of digestion before fermentation can occur. In this way chaff is very useful, especially after long fasts."

This system, however, is not well adapted to either the hunter or the race-horse; because their food must be in smaller bulk, in order that the action of their lungs may not be impeded by the distention of the stomach; still many hunters have gone well over the field, which have been manger-fed, the proportion of corn, however, being materially increased.

For the agricultural and cart-horse, eight pounds of oats and two of beans should be added to every twenty pounds of chaff. Thirty-four, or thirty-six pounds of the mixture, will be sufficient for any moderate-sized horse, even with hard work. The dray and large waggon-horse may require forty pounds. Hay in the rack at night is, in this case, to be omitted altogether. The rack, however, may remain, as it is useful for the sick horse, or to contain tares, or other green meat, which may occasionally be given.

Horses take great delight in this provender; but damaged straw should not be used for making chaff, as the corn it contains may tempt a horse to eat, even if it be not good. More injury is done by eating damaged hay or musty oats, than is generally imagined. Therefore the advantage of this system of manger-feeding, will, as a matter of course, be entirely counteracted, if it be made the vehicle for the consumption of unwholesome materials. One of the most important advantages to be derived from manger-feeding is, that the animal, by the union of eating nutritious matter with the more bulky kind (hay-chaff), his stomach is filled the sooner, and has, consequently, more time for rest—a very considerable consequence to a horse on the road.

Where the manger system of feeding is not adopted, or where the hay is still given at night, and chaff and corn in the day, there is no error into which the farmer is so apt to fall as that of giving an undue quantity of hay, and that generally of the worst kind. If the manger system is good, there can be no necessity for hay; or if there is, only for a small quantity of it; but if the rack is overloaded, the greedy horse will be eating all night, instead of taking his rest; and when the time for the morning feed arrives, his stomach will already be filled. He will then, from the want of sleep, be less capable of work, and from the long-continued distention of the stomach rendering it impossible for his food to have been properly digested.

It is a good practice to sprinkle the hay with water in which salt has been dissolved, as it is more palatable to the animal. Indeed, the horse will leave the best unsalted hay for that of an inferior quality which has been moistened with brine; and there can be no doubt that the salt very materially assists the process of digestion. The preferable way to use the salt is to sprinkle it over the different layers as the rick is formed. From its attraction for water, it would combine with that excess of moisture, which, in wet seasons, is the cause of too rapid and violent fermentation, and of the hay becoming mow-burnt, or the rick sometimes catching fire, and it would become more incorporated with the hay. The only objection to its being thus used is, that the colour of the hay is not so bright; but

this would be of little consequence for home consumption.

The comparative advantages of chaff and rack-feeding, are thus given by Professor Stewart:—

"Where the stablemen are careful, waste of fodder is diminished, but not prevented, by feeding from the manger.

"Where the racks are good, careful stablemen may prevent nearly all waste of fodder, without cutting it.

"An accurate distribution of fodder is not a very important object.

"No horse seems to like his corn the better for being mingled with chaff.

"Among half-starved horses, chaff-cutting promotes the consumption of damaged fodder.

"Full-fed horses, rather than eat the mixture of sound with unsound, will reject the whole, or eat less than their work demands.

"Chaff is more easily eaten than hay. This is an advantage to old horses and others working all day—a disadvantage when the horses stand long in the stable.

"Chaff ensures complete mastication and deliberate digestion of the corn. It is of considerable, and of most importance in this respect. All the fodder need not to be mingled with the corn; one pound of chaff being sufficient to secure the mastication and slow ingestion of four pounds of corn.

"The cost of cutting all the fodder, especially for heavy horses, is repaid only when hay is dear, and wasted in large quantities.

"Among hard-working horses, bad food should never be cut."

We will now briefly enumerate the principal vegetables which enter into the food of the horse.

OATS.

In almost every part of Great Britain, oats have been selected as that portion of the food which is to afford the principal nourishment. They contain seven hundred and forty-three parts out of a thousand, of nutritive matter, and should be old, heavy, dry, and sweet. New oats will weigh ten or fifteen per cent. more than old; but the difference consists principally in watery matter, which is gradually evaporated. New oats are not so easily ground down by the teeth as old ones, and form a more glutinous mass, difficult to digest. Therefore, when eaten in considerable quantities, they are apt to become so unwholesome as to occasion colic, and even staggers. Oats should be plump, bright in colour, and free from unpleasant taste or smell. The musty smell of wetted or damaged corn, is caused by a fungus which grows upon the seed, and which has an injurious effect on the urinary organs, and often on the intestines, producing profuse staling, inflammation of the kidney or colic, and also of the bowels. This musty smell may be removed by kiln-drying the oats, but care should be taken that too great a degree of heat is not employed. This, however, should be sufficient to destroy the fungus, without injuring the vitality of the seed. Kiln-burnt oats are not so grateful to the animal, as they acquire a heating quality, which not unfrequently produces inflammation of the eyes, and mangy affections of the skin. All the expense of threshing the unthreshed oat-straw would be saved if cut for chaff. It is better than barley straw, but does not contain so much nourishment as that of wheat. When the horse is fed on hay and oats, the quantity of the latter must vary with his size and the work to be performed. Nine or ten pounds a day will be a fair allowance for one of fifteen hands one or two inches high, in moderate work, with a proportionate quantity of hay. In summer, when green food is given daily, reduce the quantity one-half. Such animals as work on the farm, have from ten to fourteen pounds, and the hunter from twelve to sixteen. There is no kind of food that can be safely substituted for good oats; as they have an inherent strengthening property which is not possessed by other kinds of food.

For the weary and tired horse, a pint of oatmeal thrown into a pail of water, is an admirable drink. It forms, also, an excellent gruel for the sick horse, leaving it to be drunk of his own accord when slung in his box, and water is denied him. As a poultice it is also excellent, having more stimulating properties than linseed meal when used alone.

BARLEY.

Barley is a common food of the horse on various parts of the continent, and, before the introduction of oats, seems to have constituted

almost his only food. It is more nutritious than oats, containing nine hundred and twenty parts of nutritive matter in every thousand. There seems, however, to be something necessary besides a great proportion of nutritive matter, in order to render any substance wholesome, strengthening, or fattening. Where horses are very hardly worked, barley does not seem to agree with them so well as oats. They are more subject to inflammatory complaints, and particularly to surfeit and mange. When barley is given, the quantity should not exceed a peck daily. It should be always bruised, and the chaff should consist of equal proportions of hay and barley-straw, and not be cut too short. If the farmer has a quantity of spotted or unsaleable barley which he wishes thus to get rid of, he must very gradually accustom his horses to it, or he will probably produce serious illness among them. For animals that are recovering from illness, barley, in the form of malt, is often serviceable, as tempting their appetite and restoring their strength. It is best given in mashes—water, considerably below the boiling heat, being poured upon it, and the vessel or pail kept covered for half an hour.

GRAINS.

Grains fresh from the mash-tub, either alone or mixed with oats or chaff, or both, may be occasionally given to draught horses; they would, however, afford very insufficient nourishment for such as are employed in quicker or harder work.

WHEAT.

Wheat is, in Great Britain, more rarely given than barley. It contains nine hundred and fifty-five parts of nutritive matter. When farmers have a damaged or unmarketable sample, they sometimes give it to their horses, and, being at first used in small quantities, they become accustomed to it, and thrive and work well. It must, however, always be bruised and given in chaff. Wheat contains a greater proportion of *gluten* or sticky adhesive matter than any other kind of grain. It is difficult of digestion, and apt to cake and form obstructions in the bowels. This will oftener be the case if the horse is suffered to drink much water soon after feeding upon it. This circumstance arises from the water passing rapidly through the stomach and small intestines, in its way to the cœcum, carrying off with it all the starch, which is the most nourishing property of wheat, and leaving the sticky mass behind to accumulate and harden, and obstruct the intestines, and frequently to destroy the animal. A horse that is fed on wheat should have very little hay. The proportion should not be more than one truss of hay to two of straw.

Wheaten flour, boiled in water to the thickness of starch, is given with good effect in over-purging, and this especially if combined with chalk and opium.

BEANS.

Beans contain only five hundred and seventy parts of nutritive matter, yet they add considerably to the strength of the horse. This fact forms a striking illustration of the principle, that the nourishing or strengthening effects of the different articles of food, depend more upon some peculiar property which they have, or some combination which they form, than on their actual quantity of nutritive matter. There are many horses that will not stand hard work without beans being mingled with their food. Those that have a tendency to purge, it may be necessary to restrain by the astringency of the bean. There is no traveller who is not aware of the difference in the spirit and endurance of his horse, whether he allows or denies him beans on his journey. They afford not merely a temporary stimulus, but they may be daily used without losing their power, or producing exhaustion. Two pounds of beans may, with advantage, be mixed with the chaff of the agricultural horse, during the winter. In summer, the quantity should be lessened, or they should be altogether discontinued. They are generally given whole, which is very absurd; for the young horse, the teeth of which are strong, seldom requires them; while the old horse, to which they are in a manner necessary, is scarcely able to masticate them. He, from being unable to break them, swallows many whole, and drops much corn from his mouth, in the ineffectual attempt to crush them. Beans should not be merely split, but bruised. They will even then give sufficient employment to

the grinders of the animal. Some postmasters use chaff with beans instead of oats. With hardly-worked horses they may possibly be allowed; but in general cases, beans, without oats, would be too binding and stimulating, and would produce costiveness, and probably megrims or staggers. Neither the hard-worked coach-horse, nor the washy one, nor the old one, could perform their tasks without them. To turf horses they are sometimes given as a stimulant. The straw of the bean is highly nutritive, and is usually given to horses.

PEAS.

Peas are occasionally given, and appear to be, in a slight degree, more nourishing than beans, and not so heating. They contain five hundred and seventy-four parts of nutritive matter. For horses of slow work they may be used; but the quantity of chaff should be increased, and a few oats added. They have not been found to answer with animals of quick draught. It is essential that they should be crushed; otherwise, on account of their globular form, they are apt to escape from the teeth, and many are swallowed whole. Exposed to warmth and moisture in the stomach, they swell very much, and may painfully and injuriously distend it. Many horses have died from gorging themselves with peas; and, on opening them, their stomachs have been found to have burst by the swelling of the vegetable. In proof of the swelling property of them, let a small phial be filled with them, tightly corked, and warm water poured upon it; the peas will burst it in a few hours.

In some northern countries, the meal of the pea is not only given as food to the horses, but, in cases of diabates, is used as a remedy.

TARES

Of the value of tares, as forming a portion of the late spring and summer food of the stabled and agricultural horse, there can be no doubt. They are very nutritive, and act as a gentle opening medicine. When surfeit-lumps appear on the skin, the horse begins to rub himself against the divisions of the stall, and the legs swell, and the heels threaten to crack: a few tares cut up with the chaff, or given instead of a portion of the hay, will often afford sometimes immediate, and generally rapid relief. Ten or twelve pounds may be supplied daily, and half of that weight of hay subtracted. It is an erroneous notion, that, given in moderate quantities, they either roughen the coat or lessen the capability for hard work. Tares furnish a greater proportion of food for a limited time than almost any other kind of forage crop.

RYE GRASS.

Rye grass supplies a valuable article of food, but is inferior to the tare. It is not so nutritive; is apt to scour; and occasionally, late in the spring, it has appeared to become injurious to the horse.

CLOVER.

Clover, for soiling the horse, is inferior to the tare and the rye grass, but nevertheless is useful when these cannot be obtained. Clover hay is, perhaps, preferable to meadow hay for chaff. It will sometimes tempt the sick animal, and may be given with advantage to horses of slow and heavy draught; but custom seems properly to have forbidden it to the hunter and the hackney.

LUCERN.

Lucern, where it can be obtained, is to be preferred even to tares, and sainfoin is superior to lucern. Although they contain but a small quantity of nutritive matter, it is easily digested, and perfectly assimilated. They speedily put both muscle and fat on the horse that is worn down by labour, and they are almost a specific for hide-bound. Some farmers have thought so highly of lucern as to substitute it for oats. This may do for the agricultural horse of slow and not heavy work; but the animal from which speedier action is sometimes required, as well as the one of all work, must have a proportion of hard meat within him.

THE SWEDISH TURNIP.

This root is an article of food the value of which has not been sufficiently appreciated, and particularly for agricultural horses. It does not contain much nutrition, but is easy of digestion, quickly fattens the animal, and produces a glossy skin. It may be given once a day—at night after the work is done, when it will be extremely grateful.

CARROTS.

The virtues of this root are not sufficiently esteemed, adding to the strength and stamina of the horse in health or in sickness. Some farmers allow a bushel of sliced carrots a-day, with chaff, without any oats; and the horses are said to be equal to all slow or agricultural work. Stewart, in his *Stable Economy*, remarks, that "this root is held in much esteem. There is none better, nor, perhaps, so good. When first given, it is slightly diuretic and laxative; but, as the horse becomes accustomed to it, these effects cease to be produced. They also improve the state of the skin. They form a good substitute for grass, and an excellent alterative for horses out of condition. To sick and idle horses they render corn unnecessary. They are beneficial in all chronic diseases connected with breathing, and have a marked influence upon chronic cough and broken wind. They are serviceable in diseases of the skin, and, in combination with oats, they restore a worn horse much sooner than oats alone."

POTATOES.

Potatoes have been sliced and given with advantage in their raw state, mixed with the chaff; but, where there has been convenience to boil or steam them, the benefit has been much greater. Some have given boiled potatoes alone; and horses, instead of turning from them, have come to prefer them even to the oat; but it is better to mix them with the manger feed, in the proportion of one pound of potatoes to two-and-a-half of the other ingredients. Professor Low says, that fifteen pounds of potatoes yield as much nourishment as four-and-a-half of oats. Von Thayer says, that three bushels are equal to one hundred and twelve pounds of hay; and Curwen says, that an acre of potatoes, in the feeding of horses, goes as far as four acres of hay. In feeding a horse on this root his water must be much curtailed.

BREAD FOR CATTLE AND HORSES.

The French frequently feed their horses on bread; and various other attempts at economy are practised out of the common management of feeding them with raw corn, which, no doubt, may be beneficial. We have heard of a team of horses, at Liverpool, to which boiled corn was always given, and the water boiled afterwards to drink. This was said to nourish them at much less expense than the common method of feeding adopted.

It is equally necessary to seek for economical food for cattle as for man. To lessen the consumption of food in rearing, preserving, and maintaining the health and strength of cattle, is to save so much for the benefit of mankind. Many neglected plants, growing in marshy ground, the tender leaves of different trees deprived of their resin by infusion, chopped straw, &c., are substances and resources which may be, and are in many instances, usefully employed.

In Sweden, oat bread is used for horses, and is found much cheaper and more salutary than the simple grain. It may be remarked that horses always pass some parts of the oats they have eaten, whole; their stomachs labour much to digest food, some part of which is entirely lost, and is even dangerous to them. Oats ground and baked would not occasion these inconveniences.

Experience has shown, that in Sweden, one ton of oats makes four hundred and eighty loaves, on which a horse may be better kept—at the rate of two loaves a day—for two hundred and forty days, than if he had had six tons or even more of raw oats. The husk of the oats remains mixed with the flour; and the weight of the water, a large quantity of which is necessarily employed in making the dough, is gained. It has also been calculated in Sweden, that after all expenses have been taken into consideration, a great saving is effected by feeding horses on bread made of oats and rye. There hay is never given without mixing it with two-thirds of chopped straw, and adding to it bread broken up. The better to preserve this bread, it should be made in the shape of cakes; and if it be prepared like biscuit, it will keep for a lengthened period of time, without losing its nutritive qualities.

Good bread for cattle may be made from the farinaceous parts of the horse-chestnut, acorns, mandragora, dog's-grass, &c. These substances may be used in the composition of bread for cattle, together with potatoes reduced to powder.

In all agricultural experiments, we must

never allow ourselves to be discouraged; creatures accustomed to a particular diet, will sometimes refuse a superior one for that to which they are habituated. It should be frequently presented to them, and before long they will relish it. Why should not leaves, chaff, straw, heath, fern, &c., reduced to powder, be mixed with this bread? Beetroot, or potatoes and flour, will serve as a vehicle for all these substances; whilst experience soon proves the quantities for producing the necessary proportions to form the required material of a substantial consistence.

In closing this portion of our work, it may be desirable to many to be made acquainted with the nourishing properties known, by chemical analysis, to exist in several of the most necessary vegetables.

1,000 parts of wheat contain 955 parts of putritive matter; barley, 920; oats, 743; peas, 574; beans, 570; potatoes, 230; red beet, 148; parsnips, 99; carrots, 98.

Of the grasses, 1,000 parts of the meadow cat's-tail, contain at the time of seeding, 98 parts of nutritive matter; narrow-leaved meadow grass in seed, and sweet-scented soft grass in flower, 95; narrow-leaved and flat-stalked meadow grass in flower, fertile meadow grass in seed, and tall fescue, in flower, 93; sweet-scented soft grass, in flower, and the aftermath, 77; florin cutin, 76; tall fescue, in the aftermath, and meadow soft grass, in flower, 74; cabbage, 73; crested dog's-tail, and brone, when flowering, 71; yellow oat, in flower, 66; Swedish turnips, 64; common turnips, 42; sainfoin, and broad-leaved and long-rooted clover, 39; white clover, 32; and lucern, 23.

TURNING OUT TO GRASS, OR THE STRAW-YARD.

When horses have been hard worked, turning out becomes a natural consequence, to refresh their limbs: they are occasionally turned out when not wanted for present use. The hunter, when the season is over, is turned into good grass, which cools the system, and prevents too great an incumbrance on the master's pocket. It also refreshes his limbs, which, if he has been regularly hunted throughout the season, stand in need of it. If, however, he has only occasionally been so, and is now wanted for the road, there is no necessity for turning him out. We have heard of horses having been kept in a stable twelve years without eating any green food, yet have continued in health and condition: while there are some constitutions that will not look well in the stable for almost any continuance of time, but soon suffer from indigestion, and hide-bound, when their coats assume a chill and russet hue. Grass, however, is by no means improper for horses. On the contrary, it is good, and such as are kept for pleasure, and only moderately used, may be put to grass, and yet, with a little corn, worked occasionally all the summer.

Turning-out in winter to a straw-yard, is a practice with those who maintain a horse for pleasure in summer, and have no occasion for him in winter. Those who cannot afford the expense of keeping a horse in the stable in winter, endeavour to persuade themselves that it is beneficial to the animal to be put into the straw-yard, and famished with cold and hunger for five or six months. Consequently, this practice is not to be recommended. Far better to sell the animal if the expense of stabling him cannot be afforded.

When gentlemen have convenience of their own to turn horses out in winter, there is no doubt of their being taken care of. In open weather there is good pasturage; and in hard weather, an out-house or stable to lie in, with plenty of hay. But as we are here speaking of straw-yards, where all that come are taken in, the practice of sending them to such repositories is a dangerous, if not a bad one. Not but that some animals may seem well enough when they are deeply bedded with clean and wholesome straw, of which they can cull the ears to fill themselves; but where they are taken in for pay, some men scarcely ever think their yards are overstocked, and provender, which is scarcely fit for the horses to lie upon, becomes their food.

Giving green food in the stable is called soiling. It is not often convenient for those who keep no more horses than they have use for, to turn them out to grass, more particularly in a season when people take pleasure on horseback, or travel on business. The work of animals of this description is hardly to be called exercise; which frequently consists of an

average, of not more than ten miles a day, and at a pace seldom exceeding more than six or eight miles an hour. Under such circumstances, green food in the stable has a cooling influence, and acts as an alterative, and therefore should be given. Indeed, there are some constitutions that do not thrive without it, dry food for a long continuance of time not agreeing with them, but making them lank and thin. Such descriptions of horses are hardly worth keeping, except for light work, as their paces and action may be very pleasing.

Green food being a kind of natural physic, cooling, and operating as a gentle laxative, many deny the necessity of any other kind of medicine. In its operative principle, more especially if the animal works on it, his litter will be very soft, if he does not quite scour. This is a great benefit to the horse, by clearing out the alimentary canal, and producing that healthy secretion of functions nature is so desirous of. After a time, however, the purgative principle passes off, and he voids his dung in rather a soft state than otherwise. An animal kept on green food should not be put to immoderate work, as it may produce inflammation of the intestines, and its frequent consequence—death.

To those who have not given this part of our subject the consideration it merits, it may be as well to observe, that green food, when cut, soon spoils. Therefore, those who buy the bundles of *vetches or tares* which are brought into market, must be careful to see that they are fresh and cool. Such vegetables being frequently cut the day before, and tied up in bundle, are full of moisture, and become heated, and soon begin to rot. They should, therefore, be fresh every day, and no more taken in than can be consumed, as they soon spoil if they happen to be pretty moist. If, therefore, there is no certainty of a regular supply, a good plan is to untie the bundles, and spread them on the spare room of the floor of the hay-loft. This will preserve them fresh for two or three days. Should the animals be in the habit of feeding on chaff, it is good policy to have a layer of vetches cut up with it. This will be found cooling and refreshing, especially if the weather is warm, and the horses in full work.

PHYSICKING.

In the course of this work we shall have occasion to make reference to cathartic and other balls. Those which, from experience, have been found the most beneficial, we have arranged in the subjoined form, and distinguished them by numbers, so that an easy reference, at all times, may be made to the different ingredients of which they are composed.

No. 1.

Barbadoes Aloes	1 oz.
Ginger (powdered fine) . .	2 drachms.

If for immediate use, form into a ball, with treacle; but if not, with soft soap. When the horse is properly prepared with bran mashes, as directed in our preceding pages—"On the Management of Hunters"—this ball will be found sufficiently strong for any animal.

No. 2.

Barbadoes Aloes	6 drachms.
Ginger	1 „

Form into a ball, as prescribed for No. 1. This ball is generally found strong enough for saddle-horses of all descriptions.

No. 3.

Barbadoes Aloes	4 drachms.
Ginger	1 „

Though this quantity of aloes will act as a drastic purge on some constitutions, it will scarcely move others. In the above formulæ of purgative medicines, you have simply those that actually stimulate the intestines to get rid of their contents.

No. 4.

Barbadoes Aloes	5 drachms.
Cape Aloes	5 „
Ginger	2 „

Mix, and form into a ball, with soft soap, for large carriage or cart horses; then treat as above. This will be found to prove pretty effective.

CHAPTER VI.

BREEDING; BREAKING-IN; CASTRATION.

BREEDING.

HAVING already touched upon this important subject, we shall here more particularly enter into it; for it is unquestionable, that within the last thirty years our horses have undergone a considerable change. The opinion, among those who may be supposed to be the best capable of forming a correct judgment, is, that there are fewer good hacks and hunters than there were formerly; and, if such be the case, it must necessarily form one of the first considerations of breeders to endeavour to discover the causes of this deterioration, and to adopt such means as may be the most likely to restore the breed, as well as to improve the character of our horses. Whether considered socially or nationally, this is an object of too much importance to be neglected.

Our observations will here be of a general nature, and will be very simple. The first axiom we would lay down is, that "like produces like;" that the progeny will inherit the qualities of its parents. Referring to the subject of diseases, we must again state our conviction, that there is scarcely one affliction by which either of the parents is affected, that the foal will not inherit, or, at least, exhibit a predisposition to. So certain is this the case, that it may safely be affirmed that even ill usage or hard work, where either has been so excessive as to lay the seeds of disease in the parents, such disease will indubitably be found to descend to their progeny. Undeniable evidence, repeated again and again, has decided the fact, that blindness, roaring, thick wind, broken wind, spavins, curbs, ring-bones, and founder, have been bequeathed, both by the sire and the dam, to the offspring. It should likewise be recollected, that although these blemishes may not appear in the immediate progeny, they frequently will in the next generation. Hence the necessity of some knowledge of the parentage both of sire and dam. Mr. Baker, of Reigate, speaking of his own experience in this matter, says—"A foal had apparently clear and good eyes; but the first day had not passed before it was evident that it was totally blind. It had Gutta Serena.

"Inquiry was then made about the sire, for the mare had good eyes. His were, on the slightest inspection, evidently bad; and not one of his colts had escaped the direful effects of his imperfect vision.

"A mare had been the subject of farcical enlargement; and not being capable of performing much work, a foal was procured from her. She survived; but the foal, soon after birth, evinced symptoms of farcy, and died.

"A mare was lame from navicular disease. A foal was bred from her, that, at five years, could scarcely go across the country, and was sold for a few pounds. The mare was a rank jib in single harness; the foal was as bad."

Peculiarity of form and constitution are also inherited. This is a most important, but neglected consideration; for however desirable or even perfect may have been the conformation of the sire, every good point may be neutralised by the defective form, or want of blood, in the mare. There are niceties here, of which some breeders were wont to be aware, and they employed their knowledge to prevent it to great advantage. When they were careful that the essential points were good in both parents, and that some minor defect in either should be met, and got rid of, by excellence in that particular point in the other, the result was creditable to their judgment, and highly profitable. Other breeders, less skilful, often so badly paired the animals, that the good points of each were, in a manner, lost. The defects of both were increased, and the produce far inferior to both sire and dam.

Of late years, these principles have been much lost sight of in the breeding of horses for general use; and the following is the explanation of it. There are nearly as good stallions as there used to be. Few horses but such as are well-formed and valuable, will be selected and

retained as stallions. They are always the very prime of the breed; but the mares are not what they used to be. Poverty has induced many of the breeders to part with those from which they used to raise their stock, and which were worth their weight in gold; and the jade on which the farmer now rides to market, or which he employs on his farm, costs him but little money, and is only kept because he cannot get much money for her. It has, likewise, become the fashion for gentlemen to ride mares, almost as frequently as geldings; and thus the better kind are taken from the breeding service, until old age or injury renders them worth little for that purpose.

In the third volume of *The Veterinarian*, this will be found strikingly pointed out by Mr. Castley, an intelligent veterinary surgeon.

It ought to be as deeply impressed as possible on the minds of breeders, that peculiarity of form and constitution are inherited from both parents; that the excellence of the mare is a point of quite as much importance as that of the horse; and that out of a sorry mare, let the horse be as perfect as he may, a good foal will rarely be produced. All this is recognised upon the turf, although poverty or carelessness has made the general breeder neglect or forget it.

In the midland counties it is recognised in matching the breed of cart-horses; and the strict attention which has been paid to it, has brought our heavy draught animals to almost the same perfection, in their way, as it has brought our blood horses. It is an unaccountable fact, however, that in our saddle-horses, our hunters, and, to a great extent, our carriage-horses, this should be left to chance.

That the constitution and endurance of the horse are inherited, no sporting man ever doubted. The qualities of the sire or the dam descend from generation to generation, and the excellences or defects of certain animals, are traced, and justly so, to some peculiarity in a far-distant ancestor.

It may, perhaps, be affirmed with justice, that there is more difficulty in selecting a good mare to breed from, than a good horse, because she should possess qualities somewhat opposite. That sufficient room may be given for the growth of the fœtus, her carcase should be long, and yet with this there should be compactness of form and shortness of leg. What can be expected from the practice of those who purchase worn-out, spavined, foundered mares, about which they fancy there have been some good points, and send them far into the country to breed from; and, with all their variety of shape, to be covered by the same horse? In a lottery like this, there may be, now and then, a prize, but there must be many blanks. If horse-breeders, possessed of good judgment, would pay the same attention to breed and shape as Mr. Bakewell did in sheep, they would probably attain their wishes in an equal degree, and greatly to their advantage, whether for the collar or the road, for racing or for hunting.

As to the shape of the stallion, little satisfactory can be said. It must depend on that of the mare, and the kind of horse wished to be bred; but if there is one point which we should say is absolutely essential, it is this, "compactness"—as much goodness and strength as possible, condensed into a little space.

Next to compactness, the inclination of the shoulder will be regarded. A huge stallion, with upright shoulders, never got a capital hunter or hackney. From him the breeder can obtain nothing but a cart or dray-horse, and that, perhaps, spoiled by the opposite form of the mare. On the other hand, an upright shoulder is desirable, if not absolutely necessary, when a mere slow draught animal is required.

It is of no little importance, that the parents should be in full possession of their natural strength and powers. It is a common error to suppose that because a mare has once been good, she may profitably be used to breed from when she is no longer capable of ordinary work. Her blood and perfect frame may ensure a foal of some value, but he will inherit a portion of the worn-out constitution of her from whom he sprung.

On the subject of breeding *in and in*—that is, persevering in the same breed, and selecting the best on either side—much has been said. The system of crossing requires larger experience and judgment, perhaps much larger than breeders usually possess. The bad qualities of the cross are too soon engrafted on the original stock; and once engrafted there,

are not, for many generations, eradicated. The good qualities of both are occasionally neutralised to a most mortifying degree. On the other hand, it is the fact, however some may deny it, that strict confinement to one breed, no matter how valuable or perfect, produces gradual deterioration. The truth here, as in many other cases, lies in pursuing the middle course. Crossing should be attempted with great caution, and the most valuable points of the same breed should be preserved, but varied, by being frequently taken from different stocks, with reference to either one or more excellences which these may have been discovered to possess. This is the secret of the turf. The pure south-eastern blood is never left, but the stock is often changed with manifest advantage.

A mare is capable of breeding at three or four years old. Some have injudiciously commenced to breed at two years old, before the form or strength of the mare is sufficiently developed, and with the development of which this early breeding will materially interfere. If she does little more than farm work, she may continue to be bred from, until she is nearly twenty; but if she has been severely worked, and bears the marks of it, let her have been what she might in her youth, she will deceive the expectations of the breeder in her old age.

The mare comes into "season" about February, and continues "horsing," at intervals, until the end of June or middle of July. Her term of gestation is from eleven to twelve months; but some have been six weeks beyond the eleven months. We may take, however, eleven months as the average. In running horses that are brought so early to the starting-post, and whether they are foaled early in January or late in April, rank as of the same age, it is of importance that the mare should go to cover as early as possible. For other breeds, the beginning of May is the most convenient period. The mare would then foal in the early part of the following April, when there would begin to be sufficient food for her and her colt, without confining them much to the stable.

From the time of covering to a few days before the expectation of foaling, the draught mare may be kept at moderate work, not only without injury, but with decided advantage. Her labour may be continued up to the very time when she is expected to foal—of which she will give at least a day's notice, by the adhesive matter that will appear about her teats. When this is observed, it will be prudent to release her from work, and keep her near home, and under the frequent inspection of some careful person.

When nearly half the time of pregnancy has elapsed, the mare should have a little better food. She should be allowed one or two feeds of corn in the day. This is about the period when mares are accustomed to slink or abort their foals, or when abortion occurs. At this time, therefore, the eye of the owner should be frequently upon them. Good feeding and moderate exercise will be the best preventives against any mishap that may be likely to occur. The mare that has once slinked her foal is ever liable to a similar accident again, and therefore should never be suffered to be with other mares about the time that this usually occurs, which is between the fourth and fifth months; for such is the power of imagination or of sympathy in the mare, that if one suffers abortion, several others in the same pasture will be certain also to prove abortive and share the same fate. Farmers wash, paint, and tar their stables to prevent some supposed infection. The infection lies in the imagination.

If a mare has been regularly exercised, and apparently in health while she was in foal, little danger will attend the act of parturition. If otherwise, and any signs of danger, it will be better to have recourse to a well-informed practitioner, rather than run the risk of injuring the mother by the violent, and frequently injudicious attempts which are often made to relieve the animal.

So soon as parturition has taken place, the mare should be turned into some well-sheltered pasture, with a hovel or shed to run into when she pleases; and as, supposing she has foaled in April, the grass is scanty, she should have a couple of feeds of corn daily. The breeder may depend upon it, that nothing is gained by starving the mother and stinting the foal at this time. It is the most important crisis in the life of the horse; and if, from false economy, his growth is arrested, his puny form and want of endurance will ever afterwards testify to the error that has been committed. The corn should be given in a trough

on the ground, that the foal may partake of it with the mother. When the new grass is abundant, the quantity of corn may be gradually lessened.

After foaling, the mare may be made to perform a moderate amount of labour in about a month. The foal is at first shut in the stable during the hours of work; but as soon as it acquires sufficient strength to toddle after the mare, and especially when she is at slow work, it will be better for the foal and the dam that they should be together. The work will contribute to the health of the mother; the foal will more frequently draw the milk, and thrive better, and will be hardy and tractable, and gradually familiarised with the objects among which it is afterwards to live. While the mother, however, is thus worked, she and the foal should be well fed; and two feeds of corn, at least, should be added to the green food which is supplied to them when turned out after their work, and at night. The mare will usually be found again in "season," at or before the expiration of a month from the time of foaling, when, if she be kept principally for breeding purposes, she may be put again to the horse.

To return, however, to the foal. It is not generally known that the refusing to suck, which is the cause of the death of many foals, as well as the scouring, which about the third day kills many more, are both produced by irritation, and consequent inflammation of the bowels, from the retention of a few small hard fæces in the rectum. These are generally more in quantity in proportion as the keep of the mare has been high.

The cure is simple: a few hours after the foal has been dropped, *a tallow candle should invariably be passed into the rectum;* and when the passage has been sufficiently softened, the fæces can easily be extracted by the finger.

In cases where scouring kills foals at a subsequent period, it is generally to be attributed to the foal heating itself by violent exercise. Consequently the mare, for the first day or two that she is let out—supposing her to be housed—ought only to be walked about with a halter, and the same practice pursued at the time of her first "horsing."

Some mares will not allow their foals to suck. This arises from the tenderness of their teats. In such cases they should have their heads tied up, and, if necessary, be otherwise prevented from kicking while they are milked by hand. The milk should be rubbed over the teats for a short time, after which they will allow the foal to suck.

Should the mare's milk be obstructed and fail, either from her having taken cold or other cause, if out, she should immediately be taken up to the house, and enticed to lie down upon a large and deep-littered bed of fresh straw, in a loose box, and every method adopted to comfort her, and to encourage the secretion of milk. *To promote this end, as much warm mild ale should be allowed as she will drink.* Should she refuse this she may be *drenched with a couple of quarts, to be repeated as frequently as may appear necessary*—her food being the finest and most fragrant hay, sweet grains, with mashes of corn and pollard. In cases of *chill*, and great weakness, the old well-known article, cordial ball, may be given in warm ale.

Should, however, the case be inflammatory, from previous high condition and fulness of blood, CORDIAL BALL AND ALL STIMULANTS SHOULD BE STRICTLY AVOIDED, and the regimen confined to *warm water* and *gruel*, in as copious quantities as can be administered. Should further measures of similar tendency be indicated, *a mild solution of Epsom salts—ten or twelve ounces in a pail of warm water*—may be given, which she may be induced to drink by means of being kept short of water. Should the symptoms demand it, a *moderate quantity of blood may be drawn*, but not otherwise. Daily walking exercise abroad, the mare being clothed, if necessary, should follow this treatment, until she is sufficiently recovered to be returned to her pasture.

During her inability to give suck, the foal must be sustained on cow's milk. This alien milk will generally disorder and gripe the foal, for which the best remedy is *two or three spoonfuls of rhubarb in powder, with an equal quantity of magnesia, in warm gruel.* This medicine should be given to the foals of working mares, which are often griped by sucking pent milk. The disorder arising from wet and cold, *a table spoonful each, of the best brandy and syrup of white poppies*, may be given several times. Mares that give birth early, and in bad weather,

should invariably be brought to the house to foal.

Mares travelling with young foals ought not to go above fifteen miles a day, and their pace should be entirely regulated by the *natural* pace of the foals, which must never be hurried so that they be left behind. Every mile or two the mares should be allowed to stop a little, and the foal be permitted to suck and rest itself. Thus the journey ought to occupy the whole of the day.

Mares having dead foals, *ought to lose a little blood, be fed moderately on cooling mashes with a little nitre,* and ON NO ACCOUNT BE ALLOWED CORN. Moderate walking exercise is very desirable for mares before foaling; and alternate mashes of plain and of scalded bran are much to be recommended.

It should be observed that geldings must not be admitted among the brood mares, as by leaping them, or harassing them about, abortion may be occasioned.

In five or six months, according to the growth of the foal, it may be weaned. It should then be housed for three weeks or a month. There can be no better place for this than the rick-yard, as affording both food and shelter. The mother should then be put to harder work, and have drier meat. *One or two urine balls, or a physic ball,* will be useful if the milk should be troublesome, or she should pine after her foal.

There is no principle of greater importance than the liberal feeding of the foal during the whole of his growth, and at this time in particular. Bruised oats and bran should form a considerable part of his daily provender. Should a dairy be upon the ground, a plentiful supply of new milk will, in a wonderful degree, hasten his development. The farmer may be assured that money is well laid out which is expended on the liberal nourishment of the growing colt; yet, while he is well fed, he should not be rendered delicate by excess of care. A racing colt is often stabled; but one that is destined to be a hunter, a hackney, or an agricultural horse, should merely have a square rick, under the leeward side of which he may shelter himself; or a hovel, into which he may go at night, or at any time run out of the rain.—By attending to these observations, their good effects will soon make themselves apparent.

BREAKING-IN.

The process of breaking-in should commence from the very period of weaning. The foal should be daily handled, partially dressed, accustomed to the halter, led about, and even tied up. The tractability, and good temper, and value of the horse, depend a great deal more upon this than breeders are aware. Everything should be done as much as possible by the man by whom the colts are fed, and whose management of them should be always kind and gentle. There is no fault for which a breeder should more emphatically correct his servant than for harshness towards the rising stock; for the principle on which their after usefulness is founded, is early attachment to, and confidence in man; and obedience, implicit obedience, resulting principally from his attentions.

There is nothing of greater importance to the owner of the horse than his being well broken. To insure this, great care should be taken to put the animal under the care of a man well qualified for his duties; for nothing is easier than to spoil the mouth of a horse, if left to the management of an injudicious person. It has been observed that more horses have been spoiled in the breaking than can ever be recovered afterwards, even if mounted by the most skilful riders.

After the second winter, the work of breaking-in the cart colt may commence in good earnest. The animal may first be bitted, with such an instrument as will not hurt his mouth, and much smaller than such bits as are in common use. With this he may be suffered to amuse himself, and to play, and to champ for an hour, on a few successive days.

Having become a little tractable, portions of the harness may be put upon him, and, last of all, the blind winkers. In a few days afterwards he may go into the team. It would add to his confidence and feeling of security if another horse could be put before and another behind him, besides the shaft horse. Let there be first only the empty waggon, and let nothing be done to him, except that he may have an occasional pat or kind word. His companion horses will keep him moving, and in his place. In some instances not much time passes, not even the first day, before he

will begin to pull with the rest, when his load may be gradually increased.

The agricultural horse is wanted to ride as well as to draw. His first lesson should, therefore, be given when he is in the team. Let his feeder, if possible, be first put upon him: he will be too much hampered by his harness, and by the other horses, to make much resistance; and, in the majority of cases, will quietly and at once submit. In riding, no whip or spur should be used in giving the animal his first lessons.

When he begins to understand his business, backing, the most difficult part of his work, may be taught him. To accomplish this he must first be made to back well without anything behind him, then with a light cart, and afterwards with some heavier load, taking the greatest care not seriously to hurt the mouth. If the first lesson causes soreness or inflammation of the gums, the colt will not readily submit to a second. If he has been rendered tractable before, by kind usage, time and patience will do all that can be wished here. Some carters are in the habit of blinding the colt when teaching him to back. This may be necessary with the restive and obstinate one, but it should be resorted to only when all other attempts to back him have failed. It is an admirable plan to teach a horse to back without blinkers, for many accidents have occurred from horses having had their bridles slipped off, and through not being accustomed to see the vehicle behind them, have become terrified, and set off at full speed, to the destruction often of themselves and of whatever object with which they may come in contact.

The colt having been thus partially broken-in, the necessity of implicit obedience may be taught him. This is not to be done by severity, but by firmness and steadiness. The voice will go a great way, but whip or spur is sometimes indispensable. The application of either of these instruments, however, is not to be of such a severe kind as to excite the animal to resistance, but to convince him that his driver or master has the power to enforce submission. Few horses are naturally of a vicious disposition. It is generally bad usage which has first provoked resistance, which has brought upon them severer chastisement, and which, as a matter of course, the fear or the stubbornness of the quadruped has still further increased. Open warfare then ensues; dislike takes place on both sides; the man hates the horse, and the horse hates the man; when both are rendered unfit to perform their duties properly together. Correction may, or must be used, to enforce implicit obedience after the education has proceeded to a certain extent, but the early lessons should be inculcated with kindness alone. Young colts are sometimes very perverse; many days will occasionally pass before they will permit the bridle to be put on, or the saddle to be worn; but one act of harshness will often double or treble this time. Patience and kindness will, after a while, prevail. This, succeeded by additional kindness and soothing on the part of the breaker, and no inconvenience or pain being suffered by the animal, all resistance becomes at an end.

The same principles will apply to the breaking-in of the horse for the road or the chase. The handling, and some portion of instruction, should, as we have said, commence from the time of weaning. The future tractability of the animal depends much on this. At two years and a-half, or three years, the regular process of breaking-in should come on. If it be delayed until the horse is four years old, his strength and obstinacy will be more difficult to overcome. A headstall is put on the colt, and a cavesson, or apparatus to confine and pinch the nose, affixed to it, with long reins. He is first accustomed to rein, then led round a ring on soft ground, and at length mounted and taught his paces. Next to preserving his temper and docility, there is nothing of so much importance as to teach him every pace, and every part of his duty, distinctly and thoroughly. Each must constitute a separate and sometimes long-continued lesson, taught by a man who will never suffer his own temper to overcome his discretion.

After the cavesson has been attached to the headstall, and the long rein put on, the first lesson is, to have him led quietly about by the breaker. A steady boy should follow behind, and occasionally threaten with the whip, but never give an actual blow, his only duty being to keep the colt up. When the animal follows readily and quietly, he may be taken to the ring, and walked round, right and left, in a very

small circle. Care should be taken to teach him this pace thoroughly, never suffering him to break into a trot. The boy with his whip may here again be necessary, but not a single blow should ever be administered.

Becoming tolerably perfect in the walk, he should be quickened to a trot, and kept steadily at it; the whip of the boy, if needful, urging him on, and the cavesson restraining him. These lessons should be short. The pace should be kept perfect and distinct in each, and docility and improvement rewarded with frequent caresses and handfuls of corn. The length of the rein may now be gradually increased, the pace quickened, and the time extended, until the animal becomes tractable in these his first lessons; towards the conclusion of which, crupper-straps, or something similar, may be attached to the clothing. These, playing about the sides and flanks, accustom him to the flapping of the coat of the rider. Any annoyance which they may at first occasion will pass over in a day or two, when the animal finds that no harm to him arises from them.

Next comes the bitting. The bit should be large and smooth, and the reins should be buckled to a ring on either side of the pad. The reins should at first be slack, and very gradually tightened. The object of this is to prepare the animal for the more perfect manner in which the head will be afterwards got into its proper position, when he is accustomed to the saddle. Occasionally the breaker should stand in front of the colt, and take hold of each side-rein near to the mouth, and press upon it, which is a mode of beginning to teach him to stop and to back at the pressure of the rein. Every act of this sort should be rewarded by some soft or gentle endearments, and no eagerness or desire to punish any occasional carelessness or waywardness which the yet unbroken animal may be inclined to display.

The colt may now be taken into the road or street to be gradually accustomed to the objects among which his services will be required. Here, from fear or playfulness, a considerable degree of starting and shying may be exhibited. As little notice as possible should be taken of these symptoms of timidity or wildness. The same or a similar object should be soon passed again, but at a greater distance. If the colt still shies, let the distance be farther increased, until he takes no notice of the object; then he may be gradually brought nearer to it, usually without the slightest difficulty. If, however, there is an attempt made to force him close to it in the first instance, the remembrance of the contest, which such an act generally causes, will be associated with the object, and the habit of shying will be established.

Hitherto, with a cool and patient breaker, the whip may have been shown, but will scarcely have been used. The colt must now, however, be accustomed to this instrument of authority. Let the breaker walk by the side of the animal, and throw his right arm over his back, holding the reins in his left; and occasionally quickening his pace, let the horse be touched with the whip very gently. It is astonishing how soon the association of the touch of the whip and the quickening of the pace become fixed in the mind of the animal. If necessary, the touches may gradually fall a little heavier, and the feeling of pain be the monitor of the necessity of increased exertion. The lessons of reining in, stopping, and backing on the pressure of the bit, may continue to be practised at the same time.

He may now be taught to bear the saddle. Some little caution will be necessary in putting it on at the first. The breaker should stand at the head of the colt, pat him, and engage his attention, while one assistant, on the off-side, gently places it on the back. Another, on the near side, will then slowly tighten the girths. If the animal submits quietly to this, as he generally will, when the previous process of breaking-in has been properly conducted, the ceremony of mounting may be attempted on the following or on the third day. The breaker will need two assistants to accomplish this operation. He will remain at the head of the colt, patting and making much of him. The rider will then put his foot into the stirrup, and bear a little weight upon it, while the man on the off-side presses equally on the other stirrup-leather; and, according to the docility of the animal, he will gradually increase the weight, until he balances himself on the stirrup. If the colt is uneasy or fearful, he should be spoken kindly to and patted, or a mouthful of corn given to him: but if he offers serious resistance, the lessons must terminate for that

day; he may probably be in better humour on the next.

When the rider has balanced himself for a minute or two, he may gently throw his leg over, and quietly seat himself. The breaker will then lead the animal round the ring, the rider sitting perfectly still. After a few minutes he will take the reins, and handle them as gently as possible, guiding the horse by the pressure of them; patting him frequently, and especially when he thinks of dismounting; and, after having dismounted, offering him a little corn or green meat. The use of the rein in checking him, and of the pressure of the leg and the touch of the heel in quickening his pace, will soon be taught him; when the education will be nearly completed.

The horse having thus far submitted himself to the breaker, these pattings and rewards must be gradually diminished; and implicit obedience mildly but firmly enforced. Severity will not often be necessary. In the great majority of cases it will be altogether uncalled for: but should the animal, in a moment of waywardness, dispute the command of the breaker, he must, at once, be taught that he is the slave of man, who has the power, by other means than those of kindness, to bend him to his will. The plan of the education of the horse is similar to that which experience and wisdom have suggested to be adopted in the education of the child. Pleasure is, as much as possible, to be associated with the early lessons; but firmness, or, if need be, coercion must be called in to confirm the habit of obedience. Tyranny and cruelty will, in the horse, more speedily excite a feeling of disobedience even than in the child; and, on every possible practicable occasion, a desire to resist the power of command. The restive and vicious horse is, in ninety-nine cases out of a hundred, made so by ill-usage, and not by nature. None but those who will take the trouble to try the experiment, are aware how absolute becomes the control which the due admixture of firmness and kindness will soon give him over any horse. The breaker should keep in his mind continually the Latin proverb, "*quod factum est bis factum est;*" what is well done, is twice done.

Shying is very frequent among young horses; and, where it appears, it should be particularly attended to by the breaker-in. It arises from several causes—namely, fear, roguery, want of work, or defective vision. The more racing-blood a horse has, the less he is subject to this infirmity or vice. The only remedy for it, is to hold hard and keep quiet. As to the whip and spur, and the silly checking a really fearful animal with a sharp curb, as though the intent were to break his jaw-bone, is an injudicious, if not a cruel practice. Mr. Lawrence says—"With affected shyers, some severity may be necessary. 'Chaps' generally fix upon some particular shying butt: for example, I recollect having, at different periods, three hacks, all very powerful; the one made choice of a windmill for the object or butt, the other a tilted waggon, and the last a pig led in a string. I was once placed in a very dangerous predicament by this last, on a road filled with carriages. It so happened, however, that I rode the two former when amiss from a violent cold, and they then paid no more attention to either windmills or tilted waggons, than to any other objects, convincing me that their shying, when in health and spirits, was pure affectation. It is a thing seldom, perhaps never, thought of or attended to, which however detracts nothing from its consequence, to accustom colts, during their breaking, to all the chief objects of their terror, which may occasion the vice of shying. After a colt shall have been a considerable time in hand, and his education nearly finished, should he be a careless and blundering goer, not sufficiently bending his knees, he should be frequently, but with great care, exercised daily in a slow trot, over rough and uneven roads.

"To connect vices with their anomalies together, I once had a fine hunting mare, an incorrigible biter; as a proof of which, before she came into my possession (but I was unapprised of it), she had killed a stable-boy; yet her biting was entirely confined to the stable, nor did she ever show either that or any other kind of vice abroad, riding perfectly quiet."

These defects in the horse will be more fully spoken of when we come to treat of his dangerous habits or vices in another part of this work. There also we will notice the power of the Irish "whisperer," Sullivan, over the animal; and notice Mr. Rarey's mode, which, in conjunction with the recent inventions of

Dr. Bunting, are likely, at no distant day, to supersede all the more antiquated systems of breaking-in.

CASTRATION.

The period at which this important operation may be best performed, depends much on the breed and form of the colt, and the purpose for which he is destined. For the common agricultural horse, the age of four or five months is the most proper time, or, at least, before he is weaned. Very few horses are lost when cut at that age. The operation should be performed when the weather is not too hot, nor the flies too numerous. We, however, enter our decided protest against the recommendation of valuable, but incautious agricultural writers, that "colts should be cut in the months of June or July, when flies pester the horses, and cause them to be continually moving about, and thereby prevent swelling." One moment's reflection will convince the reader that nothing can be more likely to produce inflammation, and consequent swelling and danger, than the torture of the flies hovering round, and stinging the sore part.

If the horse is designed either for the carriage or for heavy draught, the farmer should not think of castrating him until he is at least a twelvemonth old; and, even then, the colt should be carefully examined. If he is thin and spare about the neck and shoulders, and low in the withers, he will materially improve by remaining uncut another six months; but if his fore-quarters are fairly developed at the age of twelve months, the operation should not be delayed, lest he become heavy and gross before, and perhaps has begun too decidedly to have a will of his own. No specific age, then, can be fixed; but the castration should be performed rather late in the spring, or early in the autumn, when the air is temperate, and particularly when the weather is dry. No preparation is necessary for the sucking colt, but it may be prudent to bleed and to physic one of more advanced age. In the majority of cases, no after treatment will be necessary, except that the animal should be sheltered from intense heat, and more particularly from wet. In temperate weather he will do much better running in the field than nursed in a close and hot stable. The moderate exercise which he will take in grazing will be preferable to perfect inaction. A large and well-ventilated box, however, may be permitted.

The manner in which the operation is performed will be properly left to the veterinary surgeon. No common gelder should, now-a-days, be permitted to perform this operation. The old way of opening the bag, or scrotum, on either side, cutting off the testicles, and preventing bleeding or hæmorrhage, by the temporary compression of the vessels while they are being seared with a hot iron, may not, perhaps, be entirely abandoned. There is at least an appearance of brutality, and, we believe, much unnecessary pain inflicted, when the spermatic cord—the vessels and the nerve—is tightly compressed between two pieces of wood, as in a powerful vice, and left there either until the testicles drop off, or is removed on the following day by the operator.

To the practice of some farmers, of twitching their colts at an early period, sometimes even so early as a month, there is stronger objection. When the operation of twitching is performed, a small cord is drawn as tightly as possible round the bag, between the testicles and the belly. The circulation is thus stopped, and, in a few days, the testicles and the bag drop off; but not until the animal has greatly suffered. It is occasionally necessary to tighten the cord on the second or third day, and inflammation and death have frequently ensued.

A new mode of performing this operation has recently been introduced—the operation by Lorison. It has the merit of apparently inflicting far less pain upon the animal, and entirely supersedes the brutal firing system. In performing it the scrotum is cut in the same manner as we have already described, and the *vas deferens* exposed and divided. A pair of forceps, made for the purpose, is then used to seize the artery, which is twisted half-a-dozen times round. As soon as the hold of the artery is relinquished, the coils are left untwisted, and the hæmorrhage has ceased. The testicle is removed, and there is neither sloughing nor danger, neither of which is desirable.

CHAPTER VII.

RIDING: LEAPING.

RIDING.

In a treatise which has for its object a full description of the horse in every situation in which that noble animal is employed, it cannot be deemed out of place to devote a brief space to the equestrian art, to which, more especially, that quadruped was originally subjected. In our observations upon training the horse, we have not even alluded to what is called the *grand menage*, but have strictly confined ourselves to that branch of breaking-in which constitutes the proper education of the English horse for the field and the road. Accordingly, those animals which require a higher degree of perfection in the *menage*, we have purposely left to the care of those professors of the riding-schools, whose business it is to teach horses to perform such feats as not only display their wonderful docility, tractability and agility; but their sagacity, as well as the entire subjection to which they have been reduced by the power of man. Therefore the horsemanship to which we shall here confine ourselves, will be restricted to that which is practised in the modern English school.

When the horse is led out, saddled and bridled, the next object of the rider ought to be to examine the state of the various equipments of his horse, and to ascertain that every part of them is strong, and has been so placed as to insure his own safety as well as the comfort of the animal he is to ride. The first object will be the bridle, to see that the head-stall be of a proper length, neither too loose nor too short; to see the curb-chain hooked in its proper place, leaving the snaffle above, and clear; the fore-top hair placed under the band of the bridle, and the reins untwisted and even.

The saddle should be put perfectly even and centrical on the back of the horse, so as not in the least to impede the motion of his shoulders; and the girths, buckled one over the other, sufficiently tight to retain the saddle firmly in its place. The real horseman inspects everything; he leaves nothing to chance. When a groom once knows that his horse has to undergo the critical examination of his master, it will have a tendency to make him careful in bringing the animal out in a perfect state.

Mr. Lawrence thus describes the next proceeding:—"The nag being led out and held, the jockey, that is to be, approaches the near left shoulder; and gathering up the reins between the fingers in his left hand, the thumb upwards, at the same time weaving his fingers into the mane of the horse, he acquires a hold-fast and purchase. The whip is held with the reins, in the left hand. With his right hand he then takes hold of the stirrup, the flat side of the leather being placed towards him, and into the stirrup inserts his left foot. Next, placing his right hand on the cantle or after-part of the saddle, and making a moderate spring or vault, being cautious, at the same time, to keep his foot and spur clear of the horse, he seats himself, and the left hand still retaining its hold of the mane, with the right he adjusts the stirrup to that foot. Being seated at his ease, as in a chair, and looking forward between the ears of his animal, he will find himself in a square and even position with him. The two forming a perfect centaur."

His next object is to adjust the reins, supposing them the bridoon or snaffle, and curb, which should be done by leaving the rein of the latter rather slack, the chief pressure being upon the snaffle rein; the curb he reserves for occasional use, when a more than ordinary command over the mouth of the horse may be necessary; the curb rein may then be drawn with the requisite force. The right foot being fixed in the stirrup, the whip, with its handle upwards, is gently withdrawn from the left to the right hand, and its usual place is down behind the calf of the leg. As to the seat, a man will sit upright, as in his chair; but in the common, and more particularly the sporting seat on horseback, the spine is bent in a

small degree outward, being directly contrary to the form in military equitation. The stirrup leathers should be of such length as to admit of the knee being sufficiently bent to retain a firm hold of the saddle; but not to that degree as to hoist the rider much above it when he stands in his stirrups. Nor should they be so long as to represent him as being a straight-kneed jockey, which detracts from his power on horseback, and is dangerous in respect to that pressure which has sometimes occasioned rupture in the belly of the rider. The foot, for the road or for sporting, indeed for the most secure seat, should be placed home in the stirrup, the toe rather elevated, and turned somewhat outward; thence arises a centre union of force between the foot and the knee, the toe being turned out, and the knee inward, pressing the saddle, which assures a firm seat. This is the very essence and groundwork of the seat in the speedy trot and gallop; and when to it are added the firm grasp of the thighs and the hold on the bridle, the stability of the seat is perfectly secured.

In military riding the seat is said to depend entirely on the equipoise, or balance, a point of consequence, no doubt, but which, on trying occasions, can only be maintained as above stated. It has been observed of bad horsemen that they can scarcely keep their spurs from the sides of their horses; but such can never be the case with the above seat, in which the greater difficulty is to reach their sides with the spurs. The act of spurring, contrary to the military mode, is performed with a kick, the toe being somewhat more turned out.

In dismounting, the left hand, inclosing the reins, resumes its former place in the mane, and the rider lands from the same side on which he mounted, with his horse safe in hand. Particular situations may render it necessary to mount on the off side. The convenience is considerable when the animal will stand still, unheld at the head, to be mounted; a point of obedience, however, to which some spirited and impatient horses can scarcely be reduced. When a horse is held for mounting, it should be by the checks of the bridle, not the reins, and least of all by the curb rein.

Being mounted, the rider may find the stirrup-leathers too long or too short. In applying the remedy the attendant should be careful to draw the buckle of the stirrup-leather to the top, and to leave the pad of the saddle smooth and even. The arms should hang easily down the waist, and, though the elbows are bent, they must not be awkwardly elevated or protruded. The bridle is held about level with, or rather above the pommel of the saddle, at a length somewhat beyond it, towards the rider. The reins should not be held so long and loose as to diminish the power of the rider in supporting the horse by a pull, in case of a false step. Few are left now of the school of Bakewell, who taught that the rider could afford his animal no possible support in case of stumbling, but that, by pulling at him, would rather accelerate his fall. The horse, well aware of the purpose for which he is mounted, will, in general, proceed, on his head being loosed; if not, an intimation, by gently moving the reins, or pressing his sides with the calves of the legs, will be sufficient. If a steady and quiet hack—and on such only a tyro should be mounted—he will commence with a walk, and, in all probability, continue that pace till put forward by his rider. Horses, indeed, full of good keep, high spirited, and having had little work, will, at starting, be impatient of a slow pace, and cut a few capers; on which the rider has nothing to do but to sit quiet with a mild and steady hand, until this merry fit is over. The proper starting pace, the walk, being continued at the rider's option, the intimations above described, or a gentle touch on the buttock with the whip or stick, will cause the animal to advance to his next pace, the slow or jog-trot—the best pace of the horse, perhaps, to those who ride for their health's sake, granting the motion be not too rough. In the walk, the slow trot, and the canter, the rider sits on his saddle as in his easy chair. In reference to the movement of the horse in the canter, Mr. Blaine says, "that the hind-legs are thrown in, and while elevated, the off fore-leg becomes raised from the ground, but the near fore-leg is not elevated until the hinder ones are replaced; and this constitutes the grand difference between the canter and the gallop. The sensation to the rider is as different as possible, and so is the action to the eye also. If this be established, it will call to mind that the whole

weight of the body must at one time rest completely on the near fore leg; and that this does take place in the canter, is evident from the effects observed; for it is a remarkable fact, though seldom noticed by old writers, that in all cantering horses the near fore leg is more deteriorated, and exhibits more effects of work than the off. Judicious horsemen, sensible of this, do not therefore permit their horses always to lead on the same leg, but frequently change the centre, and gallop, canter, and trot sometimes with the right, and sometimes with the left shoulder forward. The right foot is usually employed in the lead, when a horse is breaking-in as a 'canterer,' and it is proper so to commence the breaking-in. If the horse is awkward, or strikes off falsely, tighten the near rein, which, inclining his head to the left, naturally advances his right shoulder, and produces the disposition, when he is pressed forward by the hand, the whip, or the heels, to canter with the right shoulder forward. But we revert to our caution to avoid the *continued* use of the leading leg, which the reader may rest assured will suffer greatly, and become eventually contracted in the foot, gorged in the pastern, or lamed by splints. Some professed horsewomen use a screw-crutch for their saddle, by which they can shift their seat; and to those who ride a great deal, this is a very salutary custom, as the constant use of one posture has drawn the figure of the rider herself a little awry." In the speedy trot he makes more use of his knees, hitching, or his body rising or falling in unison with the motion of the horse. This motion of rising in the stirrups saves an immense amount of fatigue to the horse and unpleasantness to his rider. The Romans condemned the trot, and called it the crucifier or torturer. In the swift gallop the rider stands in his stirrups, chiefly depending on the grasp of his knees and thighs. Formerly it was the practice to ride a galloper with stirrup-leathers too short, which made the seat unsteady, and too much dependence was placed for support on the reins. It is obviously impossible to lay down a precise rule in this case. The length at which to ride a racing-pace, whether trot or gallop, must be left to the judgment and convenience of the rider, with the remark that, of the extremes, riding too short is the worst. Rising in the trot, and lifting and working the horse along with the reins in the gallop by the jockey, are, no doubt, practices purely English.

Beyond the slow trot, the motion of few horses is sufficiently smooth and easy to encourage the rider to sit upon the saddle, nor is the appearance of such a seat very graceful. It is preferable then, if more speed in the trot be desired, to advance to that degree in which the rider may rise in his stirrups; in order to perform this easily and gracefully, the rate must be somewhat considerable. To put the animal into a canter, a touch of the left heel, and a gentle pull of the right rein, for which the right hand may be used, is the proper method.

Of the *hand-gallop*, with the right shoulder forward, Mr. Blaine says—"At the instant the horse elevates his fore quarters by means of the muscles of the loins, he throws his fore legs also forwards, through the agency of the muscles distributed to the shoulders and arms; but it appears that he does not elevate his fore limbs equally; the right is raised a little more, and it is likewise carried a little further forward than the left, which makes the action a pace not a leap. During this elevation, and in some instances preparatory to it, the right, or off hind foot, moves slightly forward, but only sufficient to gain a true centre, and to correspond with the increased forwardness of the right shoulder; the near hind leg, it must be remembered, yet remains fixed. The fore extremities now reach the ground, the near fore a little before its fellow, the off fore doubling over it and placing itself a little beyond it; and the slower the gallop, the more considerable will be the distance between the placing the fore legs. As soon as the near fore leg has met the ground, and before the off fore has yet taken its full bearing, the hinder legs are moved in the following manner:—the near hind elevates itself; and, as it reaches the ground, the off hind passes it and becomes placed also. It is now that the horse begins to be *all in air* in this pace; for on the next spring that the hind quarters make—the fore quarters being already elevated from the last impulse—the animal is, of necessity, completely detached from the ground. The next period when he is likewise so, is when the fore

quarters, meeting the ground, gain a new impulse by their rebound; the haunches are again thrown in to take their share in the support, and, also, to give their impelling power to the mass."

The simplest of all the paces of the horse is the full gallop. "Simple as it is, however," says the same eminent veterinary surgeon, "it cannot, in any instance, be commenced without the intervention of the slower gallop, in which one of the hinder legs is first advanced to establish a new centre; for it would require too great an effort to raise the fore parts at once from a state of rest by means of the loins, and to throw them forwards at the first action to a considerable distance by means of the haunches and thighs. The fact is well known to jockeys and other sporting characters, and they often derive profit from the circumstance, by wagering with the unwary, that no horse shall be found to gallop one hundred yards while a man runs fifty, provided each start together; in which case so much time is lost in acquiring the due momentum, that the man has often won; make but the race for one hundred and fifty yards, and the horse would beat; for now the impetus being acquired, he arrives at sufficient momentum to overtake his antagonist. In the extended gallop, the fore parts, when raised, are forced forward by the alternate flexions and extensions of the angles of the hinder parts; and as both of the fore and both of the hind legs, in the racing gallop, become opposed to the ground in succession at the same moment —that is, as the two fore feet at once beat the ground together, and then the two hind, so it is evident that the gallop, if full, is nothing more than a repetition of leaps. Quickly as these leaps are repeated, yet the surface of ground passed over at each of them must necessarily be great to accomplish the pace at which the good racer goes. Hambletonian, in his match against Diamond, is said to have covered eighty-three-and-a-half feet of ground in a second; and by the calculations of M. St. Bel, Eclipse covered eighty-five feet of ground in the same time, when at the top of his speed. Every turf amateur must have remarked the horizontal position of the body in the racer at the momentous struggle. Every departure from a rectilinear form of the body would detract from the rapidity of its flight, and, therefore, even the head and neck are carried so as to fall within the line of the trunk. As a compensation, however, for the loss of the power sustained, the limbs are most extensively flexed, that the circles they form may be more extended."

On any critical occasion, whether arising from embarrassment on the road, or from unquietness in the horse, the reins may be taken separately in each hand; and this is much practised both in riding and driving. It obviously increases the power of the rider over his animal, and is useful in cases of starting and shying, or in any attempt to turn round, in plunging, kicking, or rearing. In the latter case, common sense will inform the rider, that he must lean forward with slack reins, or he may pull the horse over; certainly one of the most dangerous accidents among the many which appertain to equestrian art. Whilst leaning forward, he should apply his spurs sharply to the sides of the horse—a punishment which will cure him of this vice, granting it is curable.

In the opposite habit of kicking out behind, which some animals have the knack of doing very high, with jerks not very comfortable to the rider's back-bone, the precisely opposite course is to be adopted, to avoid a somersault over the shoulders of the horse. The rule now is—sit back, sit fast, pull hard, holding the head of the animal as high as possible, and spurring with force at every interval of kicking. Having the opportunity also, use the whip effectually on the thigh, the belly, and, if necessary, on the jaws. In a confirmed case of vice, nothing short of intimidation and absolute conquest will succeed. Such severity, indeed, instead of a cure, may sometimes produce desperation; and when patience and mild measures will succeed, they are infinitely preferable. We would always recommend that spurs be worn. With a restive horse they are indispensable; and in the case of being placed between two objects, one of which alarms him, and the other dangerous for him to come in contact with, the spur on the dangerous side is of unspeakable use, as constituting the principal dependence in aid of the hand of the rider to keep the horse in his safe and proper place.

Adams, an equestrian writer, says, the body must always be in a situation, not only to preserve its balance, but to maintain its seat. The distinction between the balance and the seat may be thus marked. The balance is the centrical or equilibrium position of the body, whatever may be the motion of the horse. The seat is the horseman's firm hold of the saddle, in situations where he might be liable to be thrown over the animal's neck, or to fall backwards over his tail.

To preserve the balance, it is evident the body of the rider must keep in the same direction as the horse's legs. For example, if the horse move straightly and uprightly on his legs, the body of the rider must be preserved in a position similarly upright; but if the horse bends or leans, as when running in a circle, or trotting round a corner, the rider must lean in the same direction, or his balance will be lost. The balance, indeed, may be preserved by a different seat; but the seat will not be secure.

Mr. Adams further remarks, that if the hand is held steady, as the horse advances in the trot, the fingers will feel, by the contraction and dilatation of the reins, a small sensation or tug, occasioned by the measure of every step. This, which is reciprocally felt in the horse's mouth, by means of the correspondence, is called the *appui;* and while the *appui* is preserved between the hand and the mouth, the animal is in perfect obedience to the rider, the hand directing him with the greatest ease, so that he seems to work by the will of the rider rather than the manipulative power. The hand then possesses, independently of other aids, more than sufficient strength to control and direct the horse that is broken and obedient.

Berenger furnishes us with five directions on the functions of the hand. They are these:—

1. Hold your hand three fingers' breadth from your body, as high as your elbow, in such manner that the joint of your little finger be upon a right line with the tip of the elbow; let your wrist be sufficiently rounded, that your knuckles may be kept directly above the neck of the horse; let your nails be exactly opposite your body, the little finger nearer to it than the others; your thumb quite flat upon the reins, which you must separate by putting your little finger between them, the right rein lying upon it. This is the first and general position.

2. Does your horse go forward; or rather, would you have him go forward? If so, yield to him your hand; and for that purpose, turn your nails downward in such a manner as to bring your thumb near your body; remove your little finger from it, and bring it into the place where your knuckles were in the first position, keeping your nails directly above the neck of your animal.

3. If you would make your horse go backward, quit the first position, and let your wrist be quite round. Then allow your thumb to be in the place of the little finger in the second position, and the little finger in that of the thumb; turn your nails quite upward, and towards your face, and your knuckles will be towards your horse's neck.

4. If you would turn your horse to the right, leave the first position, and carry your nails to the right; then your hand upside down, in such a manner that your thumb be carried out to the left, and the little finger be brought to the right.

5. If you would turn to the left, quit again the first position; carry the back of your hand slightly to the left, so that the knuckles may come under a little, that the thumb may incline to the right, and the little finger to the left.

These different positions, however, adds Berenger, are, when taken singly, insufficient, unless the horseman be able to pass from the one to the other with readiness and order.

We have spoken of terrifying the vicious horse into subordination by severity; but a man of right feeling and reflection will always endeavour to render the labour of his animal as little irksome, and as comfortable to him as possible, and will, therefore, give him his rein, and bear as lightly on his mouth as may be consistent with such a hold upon him as the necessity of the emergency may require. If it appears we have laid much stress on the fixedness and grasp of the reins, we intended that grasp, like the curb of the bridal, to be only for occasional use; but by no means that the rider should be a mere fixture, as though nailed to the saddle. On the contrary, he should learn to sit at his ease, pliable to the motions of his horse, and in full possession of a just equipoise.

In speaking of bridles, we should observe that the curb alone, and with single rein, is an unfair bridle, and entirely deceptive to the rider, since its first effect is to torture, and ultimately to harden the mouth of the animal, depriving it of that sensibility which is the basis of what we should call a good mouth. The curb, beside, is an awkward bit with which to effect the turn, it being only calculated for pulling straight forward. In former days the snaffle was deemed the severest bit, no doubt from its having been made small and sharp. Since then the snaffle has been changed into a mild bit, although hard and sharp snaffles still remain. Young horses should be first put to work with mild bits, and chiefly accustomed to the snaffle, which will ensure a good mouth, sufficiently hard for fair pulling, yet with a due share of sensibility and liability to be affected and acted on by the occasional use of the curb. The snaffle bit should be of considerable thickness, particularly at the ends next to the reins, and not made so long that the joint will work into the bars of the mouth. Many riders prefer a good snaffle-bridle horse to any other; still we think there is an additional convenience in the double-reined bridle, in case of a rein breaking.

In reference to the lady's horse, her pad should indicate considerable blood; and should rarely exceed fifteen hands in height; its paces should be rough; and the trot should be both slow and easy, which is the pace of health, and which is a valuable quality. The canter, however, is the principal requisite, which should be both natural and graceful; the neck handsomely curved, and the mouth possessed of a pleasant feeling. Whatever may be the natural beauties of such animals, however, the grand consideration is in the safety of their step; for a horse deficient in this respect, is perhaps, in his canter, always most liable to "kiss the ground." The most graceful canterers may be observed to lead generally with the off leg; but, no doubt, there is such an error as a horse, both in his canter and gallop, going with the wrong leg first, to the great uneasiness of the rider. This is more particularly felt on worn and battered horses, which change their legs to procure for themselves a momentary cessation from weakness, weariness, or pain.

The person who attends for the purpose of assisting a lady to mount her animal, should be close to her, join his hands, by placing his fingers within each other, to form a stirrup for her left foot, as near to the ground as possible. Her left knee must be quite straight, which will facilitate the assistant's effort to place her in the saddle—an act facilitated by a moderate spring from herself.

Some masters teach their lady pupils to ride on either side of the horse, and recommend the pommel of the saddle to be made very low, that the knee may not be thrown too high. They also recommend that the pommel be made with a screw, to be taken off in case of a lady wishing to change sides when she may desire it.

Ladies' riding-shoes should be always straight-soled, as, in case of accident, there is the risk of the foot hanging in the stirrup, when the sole, according to the old fashion, is hollow next the heel. A lady's pad should particularly be accustomed to walk off quietly; and with respect to his improvement in that pace, it is accomplished by touching him gently behind with the whip.

In case a lady should have to dismount with the assistance of only one person to hold her horse, steps or a chair are requisite. If there is not this convenience, she springs from her seat; and should her pad, which is so often the case, be upwards of fifteen hands, she may sometimes meet with a strained ankle, or some other accident. Having an assistant, she gives him her left hand, and holding herself by the crutch of the saddle, she alights. Her preliminary act, however, is gently to change her whip from the right to the left, or bridle hand, leaving its end to hang down the near shoulder of her pad, placing the reins upon the upright horn of the saddle, on which, also, she rests her right hand. Her garments clear of giving any obstruction, she may then, turning a little to the right, make her spring towards the assistant, who is ready to break her fall. She should be careful, on quitting the stirrup, to keep her knee upon the crutch, as a security in case of the horse starting. It is perhaps unnecessary to mention, that a gentleman who attends a lady on horseback, rides on her near side; and that it is one of his first duties, to keep himself between the lady and any

carriages or horsemen that may be met with in passing and repassing them.

LEAPING.

As to leaping, initiatory practice may be had at the bar, at school, or at any fences which may present themselves. The rules for sitting, in a leap, are precisely the same as those which refer to an animal when unquiet, and alternately rearing and kicking. If it is a flying leap, sit fast, give the nag his head, and preserve your own circumspection. It may be often necessary to touch your horse with the spur or whip towards the finish of his leap, in order to make him clear his hind legs; but in the whole of this feat, much ought, indeed must be, confided to the animal himself. If seasoned, and a staunch fencer, it is a perilous thing to drive him at a leap that he, most assuredly the best and safest judge, has refused. How many accidents have happened from this vain-glorious practice! Nor is it always prudent to drive a raw horse, by the force of whip and spur, at a fence that has alarmed him, as it may render him habitually desperate and careless.

The way to make a horse a steady, prompt, and safe fencer, is to suffer him to take it by degrees, and spontaneously. Some very excellent hedge-fencers are naturally shy of timber, in particular palings and hurdles. Such horses cannot be safely put to these impediments of any considerable height.

For leaping, the Irish horse is unrivalled. It is not, however, the leaping of the English horse, striding, as it were, over a low fence, and stretched at his full length over a higher one; but it resembles the jump of the deer. The training of the Irish horse must, we suppose, make this difference, as in riding, in that country, a horseman has to meet with fences very different from those characteristic of England—stone walls being common. We will, however, more particularly enter into a description of some of the varieties of leaps.

The standing leap is naturally the first to be described; and although some daring Meltonians may pronounce it as somewhat slow, still it requires very skilful management to accomplish it well. In a little treatise, entitled *Graceful Riding; a Pocket Manual for Equestrians*, by Mr. Waite, a riding-master, we have the movements which occur in the standing-leap, very clearly and briefly described. "Let the rider," says this professor, "take up his horse at an animating pace; halt him with a tight hand upon his haunches; when rising at the leap, the rider should only just feel the reins, so as to prepare for slackening them when he springs forward, yielding them without reserve, as at the time the horse must be left quite at liberty. As the horse's hind feet come to the ground, the rider must again collect him, resume his usual position, and move on at the same pace, and his body must be inclined forward as the horse rises, and backwards as he alights."

In the flying-leap the horse must not be hurried, "but taken up at a brisk pace, with a light and steady hand, keeping his head perfectly steady and straight to the bar or fence. This position is the same as in the standing-leap; and the aids required are the same as for making a horse canter. If held too tight in the act of leaping, the horse is likely to overstrain himself and fall. If hurried at a leap, it may cause him to miss his distance, and spring too soon or too late; therefore his pace must be regulated, so that he may take his spring distant enough, and proportionate to its height, so that he may clear it. When nearing the leap, the rider must sit perfectly square, erect, pliant and easy in the act of leaping: on arriving at the opposite side of the leap, throw the body well back, and again have the horse well in hand."

We have spoken of the Irish horses as being excellent leapers; and in what is called the *double leap*, or *buck jump*, their vast stretch is exemplified to an extraordinary extent. It is observed by Mr. Apperley, in vol. xi. of the *Encyclopædia Britannica*, the power which some horses have of giving an additional impetus to their flight after they have left the ground in a leap. "After all," says he, "the most extraordinary fact relating to the leaping of horses, is the power they have of extending themselves, by a second spring as it were, when, on being suspended in the air, they perceive something on the further side of a fence for which they were not prepared. That they occasionally do this under good horsemen, all *good horsemen* of experience can vouch for;

but whence the fulcrum is derived, it would be difficult to determine."

In reference to this power in the horse, Mr. Blaine is of the same opinion, and, indeed, cites Mr. Apperley in support of it. The buck-leap is not made when the horse is at the top of his speed, but when at a trot, canter, or short hand-gallop. Buck-leapers, however, are not considered very safe, especially if there is fatigue in the cases of the animals making them. "The horse, in such a case," says Mr. Blaine, "not being able to bear the jar of a secondary effort of the joints to relieve himself, the attempt often brings him down, and thus it is that buck-leapers are seldom safe ones. We would caution the nervous rider against the dangerous custom which some have, at every downward leap, of grasping the cantle of the saddle with the whip-hand, for it not only displaces the body, and, consequently, unsteadies the seat, but it has likewise dislocated the shoulder. We have seen others elevate the whip-hand at every flying leap; and the action appears to have become so natural to them as not at all to discompose their seat. In Ireland this is very common; and among the regular 'Pats,' it is accompanied with a vociferous 'hough,' the rise of the hand and voice being synchronous; neither is it improbable that, from custom, both the action and sound are inspiriting to the rider—perhaps to the horse also."

What are called the *trial-leaps* of the Irish horses are, perhaps, the most extraordinary instances of springing power that are to be found in any country in the world. They are taken over stone walls of six feet high, built firm throughout by coping and dashing. When Mr. Blaine was with his regiment in Ireland, he had opportunities of witnessing some of these daring feats. "Over these walls it was a very common occurrence for their crack fieldsmen to ride, but it was owned that some of the stones were usually displaced in the leap. Indeed, it was this very circumstance that deprived the enterprise of half its danger. A good horse there, when hunting, seldom baulked such a leap; for he is aware that either his knees or his breast will displace the first tier of loose stone; the next rider who follows does the same; and each one who succeeds, is in more and more peril from the loose stones, which very frequently give horse and rider an awful somersault. That high fencing-horses are almost, as it were, indigenous to Ireland, we might conclude from the circumstance that, at one of the great horse fairs held at Ballinasloe, the parish pound, which is six feet in height, forms the trial-leap of the high-priced horses bought there, each of which, we are told, is expected to leap it ere the bargain is concluded. It is also recorded of a descendant of old Pot-8-os, from an Irish half-bred mare, that she leaped a wall of seven feet high, built for the purpose, in Phœnix Park, Dublin."

On the 24th of February, 1792, an Irish bay horse, for the honour of Ireland, leapt standing, the wall of Hyde Park, which was six feet and a-half high on the inside, and eight on the outside, where a long bed of dung was laid to receive him on his descent. This horse was the property of Mr. Bingham. It was twice done by the same animal, which, on the second leap, merely displaced a few bricks. Steeple-chasers, of later years, are also said to have achieved some extraordinary leaps. Charity, winner of the Newport Pagnel Steeple-Chase in 1841, cleared twenty-eight feet and a bank; and Peter Simple, at the Liverpool Steeple-Chase, cleared the artificial water-cut, opposite the Grand Stand, leaving his measured foot-prints thirty-two feet from bank to bank.

We will conclude these feats of leaping by giving a sustained instance of this power in the horse; and which shows the wonderful stamina possessed by some of the species. A match was made between Sir Charles Turner and the Earl of March, upon these conditions, that the former should "ride ten miles within the hour, in which he was to take forty leaps, each leap to be one yard, one quarter, and seven inches high." The stake was 1,000 guineas, which Sir Charles, with great ease, won upon a Galloway, in thirty-six minutes.

Painted by G H Laporte

Engraved by T S Engleheart

CLEARING THE FENCE.

CHAPTER VIII.

PURCHASING A HORSE; CHOOSING; EXAMINATION FOR DEFECTS AND DISEASE; JUDGING OF AGE BY THE TEETH.

REMARKS ON THE PURCHASING OF A HORSE.

SOUNDNESS in a horse is one of the first requisites in its purchase or sale; and there are few subjects upon which greater doubt, difficulty, and annoyance has arisen, than upon the condition and qualities of the animal that is about to pass from the hands of one master to those of another. There are few trades in which there is more deception practised than in the one pursued by the horse-dealer. "Beautiful as the animal is," says the editor of *The Horse*, "and identified as he is so much with our pleasure and our profit, he has been the object of almost universal regard; and there are few persons who do not pretend to be somewhat competent judges of his form, qualities, and worth. From the nobleman, with his numerous and valuable stud, to the meanest helper in the stable, and not excluding even the mechanic, who scarcely crosses, or sits behind a horse once in a twelvemonth, there is scarcely a man who would not be offended if he were thought to be altogether ignorant of horse-flesh. There is no subject on which he is so positive; there is no subject on which, generally speaking, he is so deficient; and there are few horses, on some points of which, these pretended and self-sufficient judges would not give a totally opposite opinion.

"The truth is, that this supposed knowledge is rarely founded on principle, or is the result of the slightest acquaintance with the actual structure of this animal, or that form and connexion of parts, on which strength, or fleetness, or stoutness, must necessarily depend. If we were constructing or examining a machine composed of levers and pullies, and by which we purposed to raise a great weight, or to set in motion certain bodies with a given velocity, we should fail in our object, or expose our ignorance of the matter, if we were not aware what kind of lever, or connexion of levers was necessary, and in what situation the ropes should be placed, and in what direction the force should be applied, and by what means we could obtain mechanical advantage, and by what peculiar construction it would inevitably be lost."

These observations show to us the necessity of studying the anatomy of animals, before we have any pretensions to be critically acquainted with the cause of their powers. However, it will be sufficient for our general readers to lay down the commonly received opinions on points which constitute what may be considered an effective animal.

As everything in nature is adapted to some especial purpose, so has every horse its own particularity. Horses, however, not only differ in kind, but, like men, in utility, in temper, in stamina, they also differ. The selection of them, therefore, in regard to these particulars, constitutes one of the nicest duties of the judge or buyer, who must readily perceive good or bad conformation; trace genealogy in the outline, and discover their excellences and their opposites with readiness and certainty.

It requires some experience, but more attentive observation, to be what is termed, in equine phraseology, a *good* judge. To know at once, at a glance, whether the nag is likely to suit; whether he is cut out for a hackney, or is calculated for harness, is a power which only extensive observation and experience can give. Does he look like a hunter, or has he any good looks about him? Does he show any blood, or is he all over a mongrel? The man who knows these things, we should recommend to the uninitiated in the mysteries of horse-dealing, to make purchases for them.

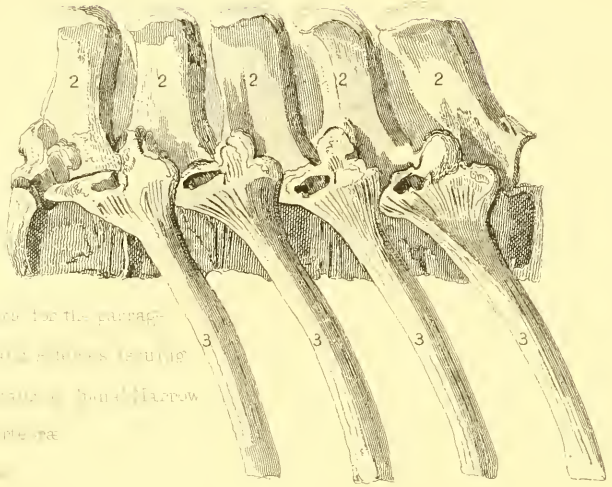
At the risk of repeating ourselves a little, we must here generally describe the outward appearance of the horse again, in order to bring this more directly under the notice of the readers who may have the intention of purchasing one. In the first place, the head should be small. A large head is considered a bad point, inasmuch as it really, under certain circumstances, detracts from the powers of the

animal. He has, in fact, more to carry. It is a burden to him; and the only way in which he can possibly carry it to advantage, is at the extremity of a short and upright neck. Next to size, its shape becomes a consideration. The forehead should be broad and flat, the eye staring and full of fire; the ears thin, fine, and often erect; the nostrils circular, dilated, and reddened within; the lips soft, thin, and hairless; the jowl extended, and the cheeks well marked. This, at least, is what it should be in the thorough-bred; and, as a general rule, the nearer any other description of horse approaches to this, the better is the family he springs from, and the more sanguine we may be in determining the extent, variety, and excellence of his qualities.

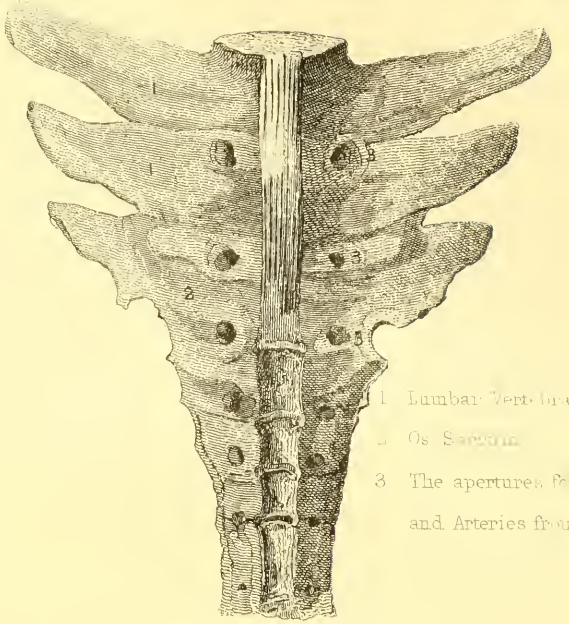
After the head comes the neck, which, if good, will make the crest form an arch, or agreeable curve, from the poll to the withers. It will be of proportionate length, and will progressively increase in breadth as it approaches the chest. A long neck, if it is straight, or but little curved, is objectionable. It has been said that short-necked horses are better winded than others, because the air has less distance to pass to and from the lungs; but it is an opinion to which little deference may be paid. The neck should be thin—at least, not thick and heavy—and rounded and straight along its lower margin. Should the canal of the jugular vein be deep, and the windpipe full and prominent below it, we may regard it as a sign of good wind. If the arch of the neck is reversed, *i. e.*, below instead of above, and the crest, or what ought to be the crest, near the withers, is hollow and sunken, the animal is, as we have before observed, said to be "ewe-necked," which is one of the greatest natural deformities common to these parts. Under such circumstances, it is usual for a dealer to say that "the neck is put on the wrong side upwards;" but, in reality, it appears to arise from its junction with the chest being too low down.

Of all the points of a horse, the shoulder, for a hackney or a hunter, is of the utmost consequence. Without a good shoulder, no animal can ride well. He may be a good harness-horse, or he may race well, but it is physically impossible for him to carry his rider with ease and pleasure on the road. But how are we to know what it is that constitutes a good shoulder, and what it is that makes it a bad one? To instruct the reader upon these points, it will be necessary to say something on its internal mechanism. The *scapulæ*' or shoulder-blades, are attached to the ribs by many powerful muscles, which move them, during the action of the animal, round their own axes; or, at least, in a very similar way; and though they can only revolve through the small segment of a circle, that segment is greater in proportion as they are more obliquely placed against the sides of the chest; hence it will be seen, that what is called an oblique shoulder, is most advantageous for motion. It is said, that the best shouldered animals have generally thin withers; but this anatomical condition is not indispensably necessary to the formation of a good shoulder, although we are aware that there are some judges of a contrary opinion. If, in viewing the fore parts of a horse, we find he rises upon the withers, and that no traces of his blade-bone can be seen under the skin, but that all appears smooth and level, we may conclude that the shoulder is oblique. A more certain proof of this, however, will be found by carrying the eye from the top of the withers to the extremity of the point of the shoulder. If it is upright, or nearly so, unless it be in a thorough-bred horse, such an animal is only fit for the collar. That horses have been fast runners on the turf with bad shoulders, is no proof that they would not have galloped better with good ones; and we must recollect, that, in a racer, the hind quarters are considered of primary importance. On the road, however, we know that bad shouldered animals are neither pleasant nor safe hackneys. They step short; are puddling walkers; roll about in the trot, and are exceedingly liable to fall.

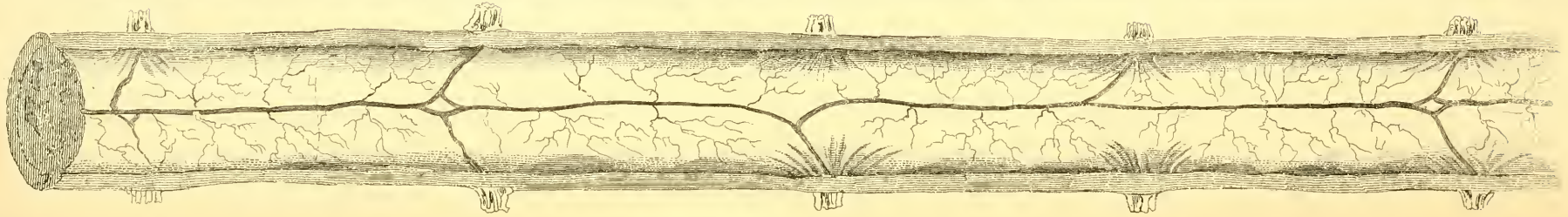
The fore legs, when viewed laterally, should descend in a straight line from the bottom of the shoulder; but when seen in front, they ought to incline gently inwards. If the elbow projects directly backwards, and the toe points with precision forwards, we may rest satisfied that the horse is not twisted in his fore legs. Turning the toe in or out in standing, is apt to be accompanied with distortion, or deformity of the limb. This circumstance, therefore, is seldom seen without materially



1. The apertures [illegible] for the passage of the Dorsal Nerves of the Spinous Processes leading to the Spinal Marrow, separating from Marrow
2. The Five last Dorsal Vertebræ
3. The Ribs from their Side



1. Lumbar Vertebræ
2. Os Sacrum
3. The apertures for the Nerves and Arteries from the Spine



lessening the value of a horse. Of the two faults, turning them out is the greater; for the pointing inwards is seldom carried to extreme. A good arm is broad and thick; long, when compared to the leg, and marked exteriorly by muscular prominences. The elbow cannot project too far back; and the more plump the muscle is immediately above it, we may conclude that so much the greater are the powers of the animal.

The knees ought to be large, broad in front, and distinctly marked with several bony knobs; lateral thickness is also of much importance. When the *radius*—the bone of the arm—instead of descending in a straight line, is directed backwards, so that the knee appears to recede from it, the horse is said to be *calf-kneed*, a term which expressly conveys the idea we have of this formation, which is always objectionable for the saddle, though it may do for the collar. The leg should fall in exactly perpendicular from the carcase, and be short when compared with the arm—the converse of this being indicative of weakness—and of sufficient breadth to enable a purchaser, even at a distance, to distinguish the tendons and bone, with perfect clearness in their relative situations. If this cannot be done, there is reason to suspect that he is what is called *gummy*—an effect produced by hard or premature work, for it is never a natural defect. Should the legs be round and straight below, they are called *stilty*, and are never firm and good; but the best, and only correct way to judge of these members, is to pass the hand down them. If they measure much round, and the sinews feel firm, hard, and distinct, like well-braced cords; and if the intervening spaces between bone and sinew are clean—free from gum—we may pronounce them good.

The fetlock, as a joint, should be of large dimensions, in proportion to the other parts. No joint, in fact, is too large, provided its bony prominences are seen with the naked eye, and its ligaments perfectly perceptible to the touch of our fingers. Knuckling over in the fetlock is a sign of either original mal-formation, such as uprightness in the pasterns, or else is the result of hard work; and the tottering affection of the limb, accompanying this state, is caused by local debility, and excessive irritability in the nervous system. The pasterns always deserve the attention of the buyer: when good, their length is in proportion to that of other parts; and they should have a considerable oblique inclination downwards and forwards to the foot. Horses with very oblique pasterns, are likely to break down; and, for this reason, they should never be shod with thin-heeled shoes. On the other hand, if they are very short and upright in these joints, they are seldom or ever sure-footed, and will, from work, soon become stilty or groggy.

The hoof is the next point to be considered, and we cannot be too careful in its examination. "No foot, no horse," is a trite, but very true saying. First, we should look to its size. A small foot is not only objectionable in itself, even though it be a natural formation, but is often a characteristic of disease; and a small and upright hoof is a morbid feature in a horse. White hoofs are to be viewed with suspicion, for they are really weaker, and more liable to disease than black ones; and if an animal has one white, and the other dark, and he is lame, in nine cases out of ten, it will be found that the halting arises from some affection in the white hoof. It must be observed, too, that the natural form of the hoof is not destroyed by narrowness at the heels. A good hoof is circular in the tread, or nearly so, measuring as much from side to side as from toe to heel: but it is frequently found that hoofs that are morbid, measure as much from toe to heel as twice the lateral diameter. On the other hand, the wall of the hoof, which should, at all times, be perfectly smooth and free from ridges—the contrary indicating disease—may be very oblique; in which case it is not only circular, but spreads out, in the tread, to such a degree as enables a judge at once to pronounce it in a state of morbidity. Large horses, bred in low marshy situations, are most subject to this kind of foot; and the strong and upright foot is likely to become contracted; so is this one subject to a disease called fleshy soles. Indeed, in the former, the sole is concave; but, in the latter, it is flat, on which account different modes of shoeing are necessary, in order to meet the requirements of each case.

In speaking of the body or carcase, it may be subdivided into the chest, the belly, and the loins. So far as regards the constitution of the horse, his stamina, or his bottom, no part

is of more consequence than the chest; but like that of many other parts, no particular construction of it is, for all sorts of animals, the best. The chest of the cart-horse should be circular, broad in the bosom, and large in the girth; that of the thorough-bred, more circumscribed, but not flat-sided, very deep, and also extensive in the girth; so that the two differ more in width than in depth. A full and prominent breast is a fine point; and the ribs should stand out with sufficient curve to afford space enough within. For this reason some prefer a shoulder of middling thickness, if it is an oblique one; because, besides the one mentioned, it has another advantage—of enabling the rider to feel that he has something substantial under him. A narrow-carcased horse is always exceptionable, for he is commonly an indifferent feeder. If we expect durability in a horse, the barrel should be round, and capacious enough to give room for the heart and lungs to play. This organisation is essential to those animals from which hard work is daily expected. The opposites of this form are generally of weak constitution, although they may give sufficient satisfaction to those riders who merely use them for summer recreation. They are generally what is termed *washy*, parting with their food too quickly, and perfectly incompetent to perform any great labour, or endure continued hard work.

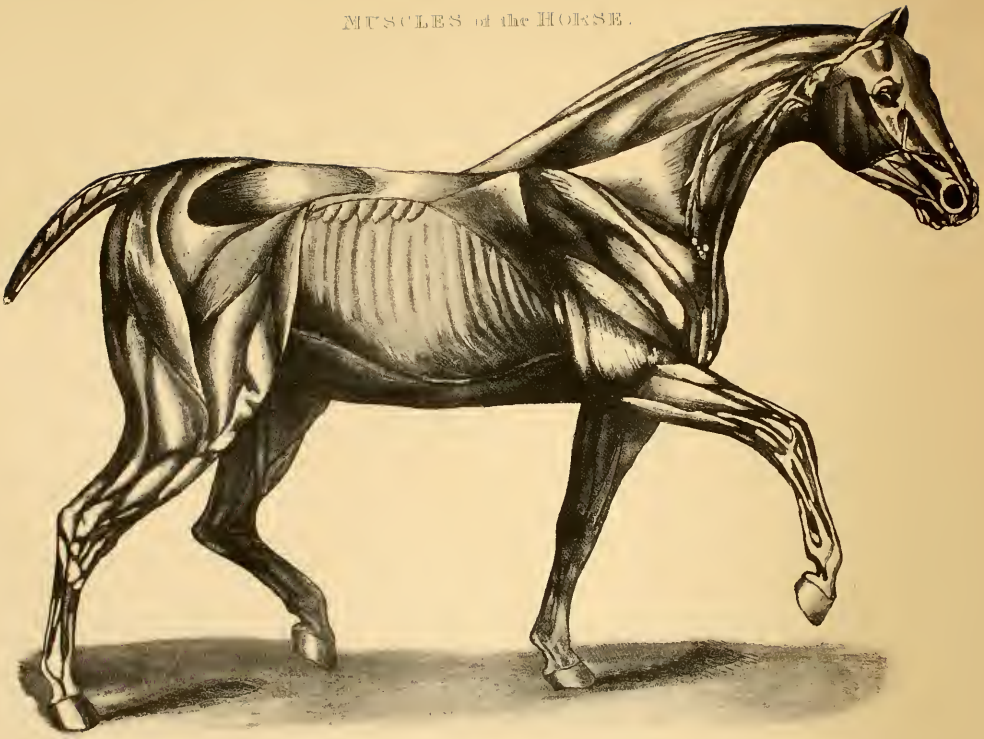
The back should be perfectly straight, as one that is hollow indicates want of strength, although such a form is often extremely pleasant to the rider. A roach back, the reverse of a hollow back, is by no means handsome, but it is stronger. One objection to it, however, is, that it is apt to chafe from the saddle. The loins are a point which merit the most particular attention. A hollow back and a narrow loin are generally indicative of natural weakness; but the latter is far more exceptionable than the former. A horse so formed can seldom carry much weight, is easily knocked up, and often proves a bad feeder. His constant hollowness in the flank, and his lank appearance altogether, after a day's hunting, amply demonstrate his utter incapability of sustaining the great exertion necessary to the satisfactory performance of his situation.

The manner in which the tail is set on must not be overlooked. A horse that carries two good ends—of which the head forms one, and the tail the other—always looks grand and showy. Above all others of his species, the charger should possess these points in perfection, to coincide with the grandeur of his carriage in the ostentatious parade of a field-day. In most horses this posterior appendage should form, when elevated, a straight line, or nearly so, with the back. A gentle declivity of the croup, however, from the summit of the rump, denotes the blood-like quarter, and adds much grace to this part in the thorough-bred animal. Should this line, however, decline very much, the quarters lose much of their beauty as well as their natural power. Nothing is so ugly, in a full-quartered horse, as to see the tail set on low down, and, as it were, springing abruptly from the rump. The dealers fig all horses indiscriminately; but this is certainly injudicious, for it subjects those which naturally carry good tails, to the same suspicion as it does those which may be really figged to answer the purposes of the dealer. Fiery and spirited hackneys seldom require nicking; and hackneys are often called cock-tails, in contradistinction to those that are thorough-bred, which never carry any but a drooping tail. A cocked-tail is incompatible with a blood-quarter; hence blood-horses should never be figged or nicked.

The quarters may be full, small, or fine and blood-like. Full quarters are such as are possessed by cart-horses, large machiners, and hackneys able to carry weight. These animals are wide in the hips, though these are but indistinctly marked, in consequence of being enveloped by large, coarse, and flabby muscles. People are too apt to regard wide hips as an objectionable point, from their giving to the horse the appearance which is called ragged, and which is produced by a bad loin, and lank, flat, and weak quarters. Were these parts well formed, the hips might be pronounced of the best description. The small quarter is one that is often seen in a horse of this form; and though its general contour may be regular and uniform, it is altogether disproportionately small when compared with the carcass. If it grows narrow towards the hinder part, the animal is said to be goose-rumped.

Of all other structures, the blood-like quarter is the best adapted for speed. In the blood-horse the tail is set on high up, and the

MUSCLES of the HORSE.



hips are lofty and prominent, but not ragged; so that many of our best racers are higher behind than before; the spaces between them and the points of the quarters great, as are also those between the latter parts and the stifles. The haunches want the plump and round appearance of the full quarter; but so far from either being lank or thin, they are striped with bold and prominent muscles, free from the adipose and cellular substance which constitutes the flabbiness of those with full quarters, and are so distinct, that even through the skin, we can distinguish where one ends and another begins. The stifles should project boldly forwards, and have a perceptible irregularity of surface. Thighs, when long, thick, and muscular, are pronounced to be "good." The hock, of all other parts in the racer, is of the utmost importance; it should be broad, flat, and of large dimensions. The propulsion of the animal machine is effected chiefly by those muscles which are attached to the point of the hock; so that the more this projects, the greater the force these can exert, simply on the principle of the lever.

The half-bred horse, with good hocks, possesses the same advantage in hunting as the racer does on the turf. The point of the hock, as we have before observed, cannot stand out too much; indeed, the greater its dimensions altogether, the better, provided it be not *gummy*, or that its various bony projections and sinewy parts are distinctly seen or felt. If the hock is narrow, its point round and not well defined, it is said to be straight; and, from its being liable to curbs, is called a *curby* hock. Should its point be directed inwards, and the toes turned outwards, the horse is said to be *cow-hocked*, or *cat-hammed*. As this is a part very liable to disease, as well as to original mal-formation, the nicest examination is required to detect all that may prove disadvantageous or injurious to its function, the proper performance of which is of so much importance, that the propulsion of the whole machine depends chiefly upon it.

In spite of the old adage, "that a good horse is never of a bad colour;" still colour is, by many persons, esteemed of considerable importance. Bays and browns are considered, generally, good colours, as they are almost invariably accompanied by black legs, and, as a consequence, good black hoofs, which are always preferable to white ones. Chestnut colours and roans are much approved of. The dark iron-grey is often a colour sought after; yet, horses of this colour, as they advance in years, gradually become lighter; and, at the age of eight or nine, will be nearly white. Grooms have an objection to this colour, and with some justice; for the animals stain themselves so frequently by even lying down, that it is almost impossible to keep them clean without washing them, and this renders them liable to take cold. There is also an objection, generally, to the natural softness of their hoofs, a circumstance which makes it difficult to shoe them firmly and well.

Such, generally speaking, may be considered the essential properties of an effective animal; and what constitutes sometimes its opposite we will now consider more particularly.

The editor of *The Horse* says—"That horse is sound in which there is no disease, nor any alteration of structure in any part which impairs, or is likely to impair his natural usefulness. That horse is unsound that labours under disease, or that has some alteration of structure that does interfere, or is likely to interfere with his natural usefulness. One horse may possess great speed, but is soon knocked up; another will work all day, but cannot be got beyond a snail's pace: one with a heavy forehead is liable to stumble, and is continually putting to hazard the neck of his rider; another, with an irritable disposition and a washy make, loses his appetite, and begins to scour if a little extra work is exacted from him. The term unsoundness cannot be applied to either of these; it would be opening a door to endless wrangling. The buyer can discern, or ought to know, whether the form of the horse is that which will render him likely to suit his purpose; and he should try him sufficiently to ascertain his natural strength, endurance, and manner of going. Unsoundness, we repeat, has reference only to disease, or to that alteration of structure which is connected with, or will produce disease, and lessen the usefulness of the animal."

These principles will be best illustrated by a brief consideration of the usual supposed causes of unsoundness.

Broken-knees certainly do not constitute

unsoundness after the wounds are healed, unless they interfere with the action of the joint; for the horse may have fallen from mere accident, or through the fault of the rider, and received no injury beyond the blemish. No person, however, will buy a horse with broken knees until he has thoroughly tried him, and satisfied himself as to his form and action.

Capped Hocks may be produced by lying on an unevenly paved stable, with a scanty supply of litter, or by the habitual vice of kicking. In neither of these cases, however, would they constitute unsoundness, although in the latter they would be an indication of vice; but, in the majority of instances, they are the consequence of sprain of the hock; and, when accompanied by enlargement, constitute unsoundness. A special warranty should always be taken against capped hocks.

Contraction is a considerable deviation from the natural form of the foot; but not necessarily constituting unsoundness. It requires, however, a most careful examination on the part of the purchaser or veterinary surgeon, to ascertain that there is no heat about the quarter, or ossification of the cartilage; that the frog, although diminished in size, is not diseased; that the horse does not step short, and go as if the foot were tender; and that there is not the slightest trace of lameness. Unless these circumstances, or some of them, are detected, a horse must not be pronounced to be unsound because his feet are contracted; for many horses possessed of feet singularly contracted, are perfectly free from lameness. A special warranty, however, should be required where the feet are at all contracted.

Corns manifestly constitute unsoundness. The portion of the foot in which they are situated will not bear the ordinary pressure of the shoe; and any accidental additional pressure, emanating from the growing down of the horn, or the introduction of dirt or gravel, will cause serious lameness. They render it necessary to wear a thick and heavy shoe, or a bar shoe, for the purpose of protecting the weakened and diseased part; and they are very seldom radically cured. They are usually found in white feet with weak low heels; but they are too common in feet of all colours.

Cough. This is a disease, and consequently unsoundness. However slight may be its degree, and of whatever short standing it may be, although it may sometimes scarcely seem to interfere with the usefulness of the horse, yet a change of stabling, or slight exposure to wet and cold, or the least over-exertion, may at other times cause it to degenerate into many dangerous complaints. A horse, therefore, should never be purchased with a cough upon him without a special warranty; or if—the cough not being observed—he is purchased under a general warranty, that warranty is thereby broken.

It is not law, however, that a horse may be returned on breach of the warranty. Unless the seller of the horse has contracted to take him back, he is not necessarily bound to do so. He is liable in damages, however. Lord Ellenborough says—"I have always held that a warranty of soundness is broken, if the animal, at the time of the sale, had any infirmity upon him that rendered him less fit for present service. It is not necessary that the disorder should be permanent or incurable. While he has a cough he is unsound, although that may either be temporary or prove mortal." In giving judgment upon another case, the same authority said—"I have always held it, that a cough is a breach of the warranty. On that understanding I have always acted, and think it quite clear." According to this judge, therefore, cough is a breach of warranty.

Roaring, Wheezing, Whistling, High-blowing, and Grunting, being the result of alteration of structure or disease in some of the air passages, and interfering with the perfect freedom of breathing, and especially when the horse is put on his speed, without doubt constitute unsoundness. There are decisions to the contrary, which are now universally admitted to be erroneous. Broken wind is still decidedly unsoundness.

Crib-biting. Although there is some difference of opinion on this point, nevertheless crib-biting must be regarded as unsoundness. This unnatural sucking in of the air must, to a certain degree, be detrimental to digestion, dispose to colic, and interfere with the strength, usefulness, and health of the horse. Some crib-biters are good goers; but they probably would have possessed more endurance had they not acquired this habit; and it is a well-

established fact, that as soon as a horse becomes a crib-biter, he, in more than nine cases out of ten, begins to lose condition. He is not, to the experienced eye, the same animal he was before. It may not lead to absolute disease, or it may rarely do so to any considerable degree; but a horse that is deficient in condition, must, to that extent, have his capability for extraordinary work diminished, although not so often as to be apparent in ordinary work; and so far, the horse is unsound. Although the habit may have had its origin in a mere trick, yet, when it has become confirmed, the animal is greatly deteriorated by it.

The wear of the front teeth, and even the frequent breaking of them, make a horse old before his time, and sometimes render it difficult, or almost impossible, for him to graze, when his state or the convenience of the owner requires that he should be turned out.

Curb constitutes unsoundness while it lasts, and perhaps while the swelling remains, although the inflammation may have subsided; for a horse that has once thrown out a curb, is, for a while at least, very liable to do so again on the slightest extra exertion. A horse, however, is not returnable, although he should spring a curb five minutes after the purchase; for it is done in a moment, and does not necessarily indicate any previous unsoundness or weakness of the part.

Cutting, as rendering a horse liable to serious injury of the legs, and indicating that he is either weak, or has an awkwardness of gait inconsistent with safety, is rather productive of unsoundness than is unsoundness itself. Many horses go lame for a considerable period after cutting themselves severely; and others have dropped from the sudden agony, and endangered themselves and their riders. As some doubt, however, exists on this subject, and as it is a very material objection to a horse, cutting, when evident, should have its serious consequences provided against by a special warranty.

Enlarged Glands. The enlargement of the glands under the jaw has not been so much considered as it ought, in an estimate of the soundness of the horse. Simple catarrh will occasionally, and severe affection of the chest will generally, be accompanied by swelling of these glands, which does not subside for a considerable time after the cold or fever has apparently been cured. To slight enlargements of the glands under the jaw much attention need not be paid; but if they are of considerable size, and especially if they are tender, and the glands at the root of the ear participate in the enlargement, and if the membrane of the nose is redder than it should be, we should hesitate in pronouncing that horse to be sound. The tumidity must, in our opinion, be considered as a symptom of disease.

Enlarged Hock. A horse with enlarged hock is unsound. The structure of this complicated joint being so materially affected, that although the animal may appear for a considerable time to have the capacity of doing ordinary work, he will occasionally fail even in that, and a few days' hard work will always lame him.

The Eyes. That inflammation of the eye of the horse which usually terminates in blindness of one or both eyes, has the peculiar character of remitting or disappearing for a time, once or twice, before it fully runs its course. The eye, after an attack of inflammation, regains so nearly its former natural brilliancy, that any one even well acquainted with horses will not always recognise the traces of former disease. After a time, however, the inflammation returns, and the result is decisive.

As the horse is being led out of the stable into the light, his manner and action should be closely observed. If he turns his ears so as to catch whatever noises may be coming from different directions, lifting his feet unusually high, hanging back on the halter, and apparently taking every step with caution, suspicion should at once be awakened that all is not right with his eyes. When the animal is given to start, it is, by many, considered a sign of some degree of defective vision. There is one cause of blindness by which the initiated buyer may be readily deceived: this is in the case of *Gutta Serena*, or paralysis in the optic nerve. "In this irremediable affection," says the author of *The Horse*, "the textures of the eye appear natural and unimpaired. There is no apparent alteration of structures, no cloudiness, no opacity; the only indication being the large and unmoveable state of the pupils, which remain equally distended in the dusk of evening and the glare of the noon-day sun."

If a man buys a horse actually blind, he will

certainly repent of his bargain, but he cannot get rid of it. He must therefore be careful, as the law will not protect him if he does not use common precaution.

Lameness, from whatever cause arising, is unsoundness. However temporary it may be, or however obscure, it lessens the utility of the horse, and renders him unsound for the time. How far his soundness may be afterwards affected, must depend on the circumstances of the case. A lame horse is for the time an unsound one.

Lord Ellenborough, in the case of *Eldon* v. *Brogden*, says—"I have always held, and now hold, that a warranty of soundness is broken if the animal, at the time of sale, has an infirmity upon him which renders him less fit for present service. It is not necessary that the disorder should be permanent or incurable. While a horse has a cough he is unsound; although it may either be temporary or may prove mortal. The horse in question having been lame at the time of sale, when he was warranted to be sound, his condition subsequently is no defence to the action." This judgment is confirmed by the decision of Mr. Baron Parke; but lawyers, as well as doctors, sometimes differ in their judgments. Chief Justice Eyre says—"A horse labouring under a temporary hurt, which is capable of being speedily cured or removed, is not an unsound horse; and where a warranty is made that such a horse is sound, it is made without any view to such an injury; nor is a horse so circumstanced within the meaning of the warranty. To vitiate the warranty, the injury the horse has sustained, or the malady under which he laboured, ought to be of a permanent nature, and not such as may arise from a temporary injury or accident."

Neurotomy. A question has arisen how far a horse that has undergone the operation of the division of the nerve of the leg, and has recovered from the lameness with which he was before affected, and stands his work well, may be considered to be sound. It was the opinion of Chief Justice Best that such a horse was unsound; and, in our opinion, there cannot be a doubt about the matter. An animal on which this operation has been performed may be improved; may cease to be lame, may go well for many years; but there is no certainty of his continuing to do so; and he is unsound.

Pumiced-foot. When the union between the horny and sensible laminæ, or little plates of the foot, is weakened, and the coffin-bone is let down, and presses upon the sole, and the sole yields to this unnatural weight, becomes rounded, and is brought in contact with the ground, and gets bruised and injured, that horse must be unsound, and unsound for ever, because there are no means by which we can replace the coffin-bone in its original situation.

Lateral Cartilages. When these become ossified, it almost invariably causes lameness, and constitutes unsoundness.

Quidding. If the mastication of the food gives pain to the animal, in consequence of soreness of the mouth or throat, he will drop it before it is perfectly chewed. This, as an indication of disease, constitutes unsoundness. Quidding sometimes arises from irregularity in the teeth, which wound the cheek with their sharp edges; or a protruding tooth renders it impossible for the horse to close his jaws so as to chew his food thoroughly. Quidding is unsoundness for the time; but the unsoundness will cease when the teeth are properly filed, or the soreness relieved, or the cause of the imperfect chewing removed.

Quittor is unsoundness.

Ring-bone. Although when the bony tumour is small, and on one side only, there is little or no lameness, yet there are a few instances in which a horse with ring-bone has worked for many years without lameness. From the action of the foot, and the stress upon the part, the inflammation and the formation of bone contract a tendency to spread so rapidly, that we must pronounce the slightest enlargement of the pasterns, or around the coronet, to be a cause of unsoundness.

Sandcrack is manifestly unsoundness. It may occur without the slightest warning; and no horse can be returned for the appearance of one that is sprung after purchase. The usual cause of this disease is too great brittleness of the crust of the hoof; but there is no infallible method of detecting this, or the degree in which it must exist, to constitute unsoundness. When the horn round the bottom of the foot has chipped off so much that only a skilful smith can fasten the shoe without pricking the

horse, or even when there is a disposition in the horn to chip and break off in a much less degree than this, the animal may probably be returned as unsound; for this brittleness of the crust is a disease of the part, or it is such an altered structure of it as to interfere materially with the usefulness of the horse.

Spavin is unsoundness, whether the bony or the blood-spavin. In the first, lameness is produced, at least at starting, in ninety-nine cases out of a hundred; and there is enlargement of the hock, which rapidly spreads with quick and hard work, although the horse may be capable of, and may even get better at slow work. If there is no lameness, still a spavined horse should be rejected, because the bony enlargement is too near a very important and complicated joint, and on the least injury or sprain of that joint, would spread over it, and materially interfere with its motion.

Bog or Blood-spavin is unsoundness, because, although it may not be productive of lameness at slow work, the rapid and powerful action of the hock in quicker motion will produce permanent, although not considerable lameness, which can hardly ever be with certainty removed.

Splint. It depends entirely on the situation of the bony tumour on the inside of the shank-bone, whether it is to be considered as unsoundness. If it is not in the neighbourhood of any joint, so as to interfere with its action, and if it does not press upon any ligament or tendon, it may be no cause of unsoundness, although it is often very disagreeable to look upon. It does not lessen the capability and value of the animal.

Stringhalt. This singular and very unpleasant action of the hind leg must be determined as a sign of unsoundness. It is an irregular communication of nervous energy to some muscle of the thigh, observable when the horse first comes from the stable, and gradually ceasing on exercise. It has usually been found in those horses that have a more than common degree of strength and endurance; but, however this may be, it must be set down in the catalogue of those morbific affections which more or less deteriorate the qualities of the horse.

Thickening of the back sinews. Sufficient attention is not always paid to the fineness of the legs of the horse. If the flexor tendons have been sprained so as to produce considerable thickening of the cellular substance in which their sheaths are enveloped, they will long afterwards, or perhaps always, be liable to sprain from causes by which they would otherwise be scarcely affected. The continuance of any considerable thickness around the sheaths of the tendons, indicates previous and violent sprain. This very thickening will fetter the action of the tendons; and after much quick work, will, from the very friction, occasionally renew the inflammation and the lameness; therefore, such a horse cannot be sound. It requires, however, a little discrimination to distinguish this from the *gumminess* or roundness of leg, peculiar to some breeds. There should be an evident difference between the injured leg and the others.

Thoroughpin, except it is of great size, is rarely productive of lameness, and therefore, when unaccompanied by any such appearance, cannot be termed unsoundness. As it is the consequence of hard work, and now and then does produce lameness, the hock should be most carefully examined, and there should be a special warranty against it.

Thrush. There are various cases on record of actions having been raised because of the thrush in horses, and the decisions have been much at variance, or perfectly contradictory. Thrush has not always been considered by legal authority as unsoundness. We, however, consider that it is so. This disease consists of a discharge of fœtid matter from the frog, accompanied with considerable tenderness of the part, and sometimes of the whole foot. It is not unfrequently brought on by the horse standing in the stable without exercise; but it is most commonly caused by the negligence of the groom allowing the frog to become rotten from the filth of the stable.

Windgalls. There are few horses perfectly free from windgalls, but they do not interfere with the action of the fetlock, or cause lameness, except when they are numerous or large. They constitute unsoundness only when they cause lameness, or are so large and numerous as to render it likely that they will cause it.

In the purchase of a horse the buyer usually receives, embodied in the receipt, what

is termed a warranty. It should be thus expressed:—

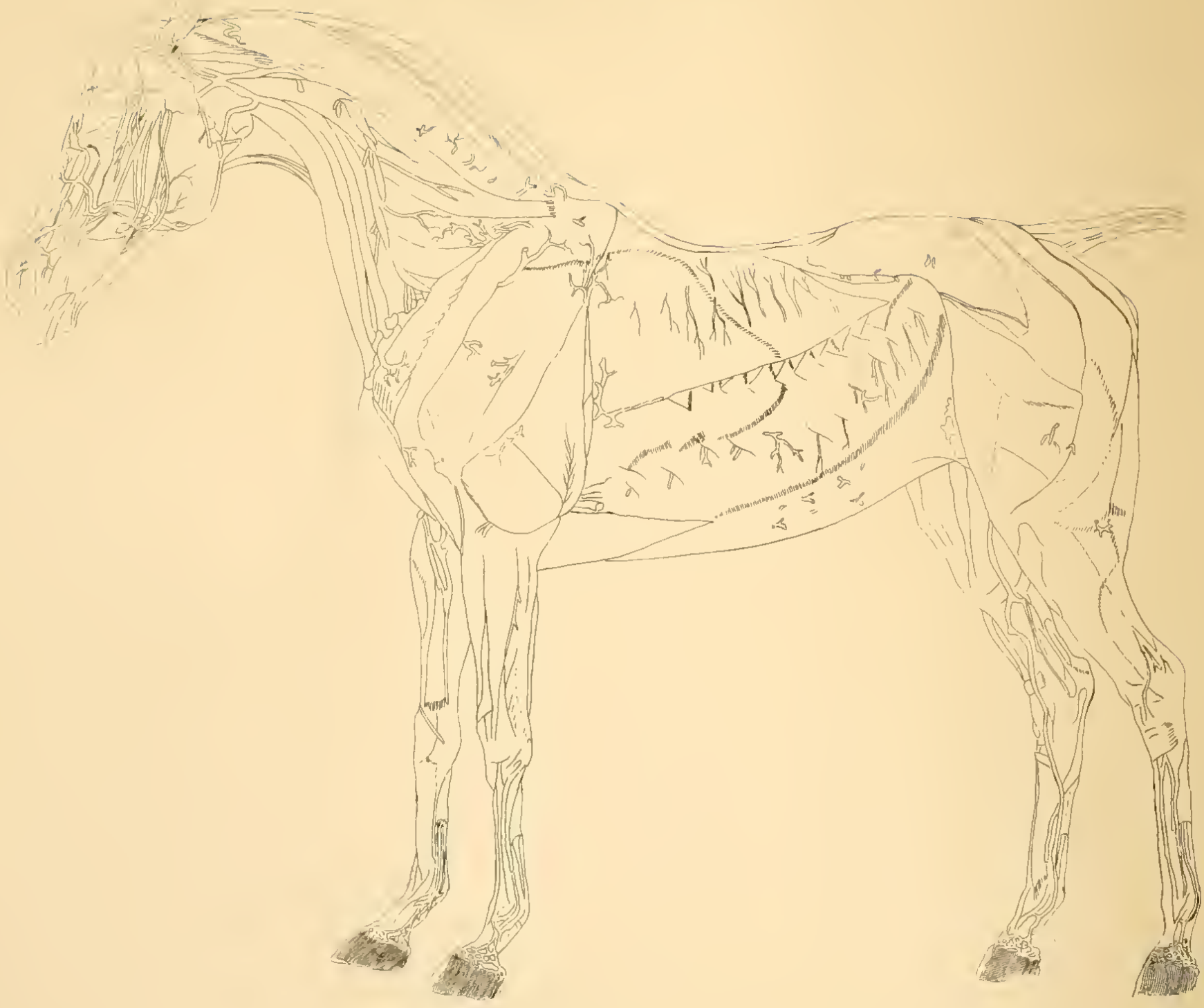
"Received of A. B. forty pounds for a grey mare, warranted only five years old, sound, free from vice, and quiet to ride and drive.

"£40. C. D."

A receipt including merely the word "warranted," extends only to soundness: "warranted sound" extends no further. The age, freedom from vice, and quietness to ride and drive, should be especially named. This warranty embraces every cause of unsoundness that can be detected, or that lurks in the constitution at the time of sale, and to every vicious habit which the animal has hitherto shown. To establish a breach of the warranty, and to be enabled to return the horse, or recover the price, the purchaser must prove that he was unsound or viciously disposed at the time of sale. In cases of cough, the horse must have been heard to cough previous to the purchase, or as he was led home, or as soon as he had entered the stable of the purchaser. Coughing, even on the following morning, will not be sufficient; for it is possible that he might have caught cold by change of stabling. If he is lame, it must be proved to have arisen from a cause that could not have occurred after the animal was in the possession of the purchaser. "No price will imply a warranty," or be equivalent to one; there must be an express warranty. A fraud must be proved, in the seller, in order that the buyer may be enabled to return the horse or maintain an action for the price. The warranty should be given at the time of sale. A warranty, or a promise to warrant the horse, given at any period antecedent to the sale, is invalid; for the horse is a very perishable commodity, and his constitution and his usefulness may undergo a considerable change within the compass of a few days. A warranty after the sale is invalid, for it is given without any legal consideration. In order to complete the purchase there must be a transfer of the animal, or a memorandum of agreement, or the payment of earnest-money. The least sum will suffice for earnest. No verbal promise to buy or to sell is binding without one of these. The moment either of these is effected, the legal transfer of property or delivery is made; and whatever may happen to the animal, the seller retains or is entitled to the money. If the purchaser exercises any act of ownership, by using the horse without leave of the vendor, or by having any operation performed, or medicines given to him, he thereby makes him his own. The warranty of a servant, we believe, is considered to be binding on the master, notwithstanding that Lord Kenyon had some doubt on this subject.

If the horse should be afterwards discovered to have been unsound at the time of warranty, the buyer may tender a return of it; and if it is not taken, may raise an action for the price. The vendor, however, is not bound to annul the contract, unless he had so agreed to do. Although not legally compelled to give notice to the seller, of the discovered unsoundness, it will be better for it to be done. The animal should then be tendered at the house or stables of the vendor. If he refuse to receive him, the animal may then be sent to a livery stable and sold. After this, an action—the horse having been tendered—may be brought for expenses, as well as for price. The keep, however, can be recovered only for the time that necessarily intervened between the tender and the determination of the action. It is not legally necessary to tender or return the horse as soon as the unsoundness is discovered. The animal may be kept for a reasonable time afterwards, and even proper medical means used to remove the unsoundness; but courtesy, and indeed justice, will require that the notice should be given as soon as possible. Although it is stated, on the authority of Lord Loughborough, that "no length of time elapsed after the sale will alter the nature of a contract originally false;" yet there are cases on record in which the plaintiff was nonsuited because he did not give notice of the unsoundness in a reasonable time. The extent of this reasonable time must depend on many circumstances.

It used to be supposed that the buyer had no right to have the horse medically treated, and that he would vitiate the warranty by doing so. The question, however, would be, has he injured or diminished the value of the animal by so doing? It will generally be prudent for him to refrain from all medical treatment, because the means adopted, however skilfully employed, may have an unfortunate effect, or may be misrepresented.



The purchaser, possibly, may like the horse, notwithstanding his discovered defect, and he may retain and bring his action for the depreciation in value on account of the unsoundness. Few, however, will do this, because the retention of the horse will cause a suspicion that the defect was of no great consequence, and will give rise to much cavil about the amount of damages; and, after all, very slight damages will probably be obtained.

Upon this point Lord Eldon says—"I take it to be clear law, that if a person purchases a horse that is warranted, and it afterwards turns out that the horse was unsound at the time of the warranty, the buyer may, if he pleases, keep the horse, and bring an action on the warranty, in which he will have a right to recover the difference between the value of a sound horse and one with such defects as existed at the time of warranty, or he may return the horse, and bring an action to return the full money paid; but, in the latter case, the seller has a right to expect that the horse shall be returned to him in the same state in which he was when sold, and not by any means diminished in value; for, if a person keeps a warranted article for any length of time after discovering its defects, and, when he returns it, it is in a worse state than it would have been if returned immediately after such a discovery, I think the party can have no defence to an action for the price of the animal on the ground of non-compliance with the warranty, but must be left to his action on the warranty to recover the difference in the value of the article warranted, and its value when sold."

Where there is no warranty an action may be brought on the ground of fraud; but this is very difficult to be maintained, and few possibly will hazard it. It will be necessary to prove that the dealer knew the defect, and that the purchaser was imposed upon by his false representation; and that, too, in a case in which a person of ordinary circumspection might have been similarly deceived. If the defect was evident to every eye, the purchaser has no remedy. He should have taken more care. If, however, a warranty was given, it extends to all unsoundness, palpable or concealed. Although a person should ignorantly or carelessly buy a blind horse, warranted sound, he may return it. The warranty is his guard, and prevents him from so closely examining the horse as he otherwise would have done; but if he buys a blind horse, thinking him to be sound, and without a warranty, he has no remedy. The law supposes every one to exercise common circumspection and common sense.

A man should have a more perfect knowledge of horses than falls to the lot of most, and a perfect knowledge of the vendor too, who ventures to purchase one without a warranty.

If a person buys a horse warranted sound, and discovering no defect in him, and relying on the warranty, resells him, and the unsoundness is discovered by the second purchaser, and the horse returned to the first purchaser, or an action commenced against him, he has his claim on the first seller, and may demand of him not only the price of the animal, or the difference in value, but every expense that may have been incurred.

Real exchanges, whether of one horse for another, or a sum of money being paid in addition by one of the parties, stand on the same ground as simple sales. If there is a warranty on either side, and that is broken, the exchange is vitiated; and if there be no warranty, deceit must be proved.

The trial of horses on sale is a very intricate one; and often leads to doubts and disputes. It is well known that a horse from a dealer's stable is seldom or ever fit for hard work until he has undergone some preparation and training. It is right that the purchaser should have a trial of him, but he should try him in a fair way; that is, in a way consistent with the state in which the animal is. If a horse from a dealer's stable is galloped far and fast, it is probable that he will soon show distress; and if he is pushed farther, inflammation and death may ensue. The dealer rarely gets compensated for this; and if it should occur soon after the sale, the animal is returned, if alive, or an action is brought for its price. When accidents have arisen in the fair trial of a horse, the decisions of the courts of law have been strangely contradictory; and, indeed, it is often difficult to determine whether the fault rests with the horse or the rider. If the horse is retained after the specified time of trial, he is supposed to be sold, with all his faults.

In London, and in most great towns, there are repositories for the periodical sale of horses by auction. They are of great convenience to the seller, who can, at once, get rid of an animal with which he wishes to part, without waiting month after month before he obtains a purchaser, and is thus relieved from the nuisance or fear of having the horse returned on account of breach of the warranty, because in these places only two days are allowed for the trial; and, if he is not returned within that period, he cannot be afterwards returned. They are also convenient to the purchaser, who can thus in a large town soon find a horse that will suit him, and which, from this restriction as to returning the animal, he will obtain twenty or thirty per cent. below the prices of the dealer. Although an auction may seem to offer a fair and open competition, there is no place at which it is more necessary for a person not much acquainted with horses, to take with him an experienced friend, and, when there, to depend on his own judgment or that of his friend, heedless of the observations or manœuvres of bystanders, the exaggerated commendations bestowed upon some horses, and the thousand faults found with others. There are always numerous groups of low dealers, copers, and chaunters, whose business it is to delude and deceive.

In speaking of the convenience and usefulness of the London horse repositories, Mr. John Lawrence says:—

"It was perhaps about the year 1740, or somewhat later, that Beavor, supposed to have first introduced the plan of sale in this mode, opened the horse repository in Little Saint Martin's Lane, London. He was succeeded by Aldridge, father of Mr. Aldridge, who retired, parting with the concern to Mr. Morris. Tattersall's repository at Hyde Park Corner, was opened about the year 1760, by Mr. Tattersall, who had previously resided at Worcester, and was proprietor of the stallion, Young Traveller. He was also engaged awhile in London, with Beavor. After the then Duke of Cumberland's decease, his stud was sold at Tattersall's in 1765. Old Tat, as he was, in due time, familiarly called, was so fortunate at his very outset, as to obtain the countenance and patronage of persons of the highest distinction, who took an interest in horses; and that important advantage continued undiminished to his successors. I first knew old Mr. Tattersall, in 1773. He was a shrewd, assiduous, and observant man, precisely one of those qualified by nature to be *faber fortunæ*, the maker of his own fortune; and he achieved it, becoming the founder of an opulent and respectable house."

We shall now endeavour to put the unwary on their guard against the nefarious and cheating practices of what are called *Horse-chaunters*. There is scarcely a provincial newspaper published in which some of these individuals do not figure, either as advertisers, or before the magistrates in some equivocal transaction. The horse seems a conductor to all sorts of villany. He is himself the object of great cruelties, and is surrounded by the most heartless of mankind. There is no article of commerce carried on in which a man has more right to have his suspicions excited than in horse-dealing. If a man goes to a repository, it would almost be the next thing to a miracle if there was not a *chaunter* to oppose him. He runs up the price to the *mark*, gives the horse a good character, and expresses his high admiration of his great qualities. The same was wont to be done to a large extent in Smithfield, as well as in places of private bargain, where the *chaunter* would approach, and make an open, though fallacious offer, bidding very near the price asked.

There is another swindling method practised among farmers' servants, or countrymen who are not likely to know much about country notes. They are what are called liberal purchasers, and pay what is asked; but pay in worthless money. In this case the countryman is so pleased with the liberality of his customer, that he is disarmed of all suspicion; and like the stranger in London, he is deprived of his horse as the other is of his money by such kind, friendly fellows, that do not know what to do with him or for him, until they despoil him of all the cash he has got.

Some time ago, an instance of *doing* a countryman occurred in Somersetshire. A farmer sent his man to Stafforddale Fair, to sell a horse, which he speedily did for £24, being the price he asked. Elated with his success, he returned in great good humour with himself, and laid the money on the table before

his master. The farmer was equally pleased; but on a little closer examination, he found that poor John had been duped by sharpers. The notes paid him were a ten-pound note and a five-guinea note—of banks which had stopped payment—and a one-pound Dorsetshire note, altered into ten. John attempted to trace the swindlers, but without success. The same gang passed a ten-pound note of a bank that had stopped nearly fifty years before.

There seems some fatality connected with horse-flesh, that immediately leads to roguery. We never heard of any directions given for the purchase of a horse, but that among the first cautions was, "never buy one of a friend." Such seems the overwhelming contamination of this traffic, that friendship itself is no security against rascality; and the moment a man has one to sell, some degree of suspicion seems to attach itself to him. The horse-dealer seems almost, by common consent, to be placed out of the pale of respectability; and if his conduct were in a parallel with his character, he would be a most accomplished deceiver.

A dealer in a large way has generally a stock of horses on hand, from which it may be easy to select. If not, his general resources are such, that he can very quickly supply any person with what he wants. To the uninitiated in buying horses, a respectable dealer is the most eligible party to transact business with.

When we reflect on the catalogue of diseases, imperfections, and vices to which a horse may be liable, and which is left to the tyro to discover, the risk he runs in making a purchase is immense. Although he may give a good price for a horse, even more than its value, still he runs less risk in buying from a respectable dealer than from strangers. If he may have paid a top price, he is unlikely to be so cheated as he might be by the *chaunting tribe*. The dealer has a residence; and if there be anything to complain of, he knows where to find him. It is natural to suppose that a dealer has an opportunity of selling a horse at a better price than most other individuals; and it being his trade, it is but reasonable that he should have his profit. Therefore, in recommending a tyro to commence his buying from a dealer, we do so on account of believing it to be the least hazardous of any other; for we will not indulge the aspirant after knowledge of the horse in the hope that he may gain it without suffering some pecuniary losses, as well as disappointment.

After he has gained some experience, it will be quite time enough for him to enter the bazaars and repositories, to trade on his own judgment; and if he has a taste for the pursuit, he will not rest satisfied till he has matured that judgment to such an extent as to find pleasure as well as profit in exercising it.

Dealers never like to take a horse back; and when this is done, the purchaser must expect to make some considerable sacrifice. No man likes to return money for any article that he may have sold in his shop; but to a dealer in horses, it is particularly objectionable. Persons who discover a horse returned, may naturally enough suppose that it was from some fault; and although the fact might be from some sheer caprice, still his value would be decreased in the opinion of those who knew it; and before he can be sold for his former value, he must wait till a stranger comes, who may know nothing of his being a returned horse. Persons conversant with buying and selling horses never think of returning them, unless from unsoundness; but the unskilled, or those who are not in the habit of disposing of horses, may naturally apply to the party to take them back again, and think him, perhaps, an unfair dealer if he refuses, on their allowing him a few guineas to boot. The fact is, a quick return is the very soul of horse-dealing; for without it, the expense soon eats the profits up. A fresh horse is more likely to meet with a purchaser than such as have lain longer in the stables. Hence the dealer's repugnance to returned horses.

In looking out for a horse in a dealer's stables, the attention of some attendant is soon attracted, when he will endeavour to put the horses into a fidgetty state by his presence, in all probability with a whip in his hand. But this should, at once, be checked. The object is to see the animal in a state of repose, and as far from any exciting causes as possible. It may be difficult to take a quiet survey; for the attendant is not always obedient, but will often persevere in exciting what is wished to be seen in a quiescent state; and sometimes parties desirous of purchasing are compelled to leave the stables in disgust.

If, however, an animal likely to suit the purpose for which he is wanted is seen, return the next day, and take an opportunity of seeing him in the stable. A horse in his stall is, so far as it goes, one of the most satisfactory situations in which he can be examined. By watching the motions of his legs and feet, lameness may be easily detected should it exist; and so may his quietness in the stable be tested. Much knowledge of his disposition may be traced in his countenance, which, to the horse, as well as to the man, forms a general index to his disposition. There is not a surer index.

We will now suppose that a suitable horse has been seen, and that his price has been ascertained, when the ceremony of examining for purchase will commence. On being assured that he is quiet to approach, you will give some gentle warning with your voice, and go up to him on his near (left) side, and laying your hand on his forehand (to regard his height), you will proceed thence to examine his eyes, mouth, and countenance; still holding his head, and turning your own to the right-about, you have a view of the curve of his neck, the height of his forehand, the position of his shoulder, and the substance of his forearm. Returning to his forehand, you descend to his legs and feet, minutely examining with your fingers every part, from above, below, withinside, and without, not forgetting the knees, as the value of the animal depends much on their perfect state.

Having satisfied yourself respecting his fore parts, your eye will glance over his back, girthing-place, carcass, and loins; thence proceeding to his hind quarter, and the setting on of his tail. You will judge how far he agrees in each and every respect with those rules of proportion already laid down in this work. The hinder legs and feet will demand a share of attention equally minute as the fore ones; nor should the inside or hollow of the hock be passed by without careful examination, since it often happens, that the injuries of hard labour are most apparent in those parts. A survey of the other side will complete the stable examination. Some prefer examining the eyes in the stable. To do this, place the horse in such a position as will let the light fall only in one direction, and see that they are of the same size, and equally full; that the haws are not prominent, and that one does not project more than the other; that the eyes are perfectly clear and transparent, and that their pupils are exactly alike in size as well as in colour.

Mr. John Lawrence, in speaking of the too common practice of dealers using the whip, gives the following caution, as well as expresses his honest indignation at its practice.

"Suffer no person belonging to the seller to be with you in the stall—unless you know and are well satisfied with the dealer's character—during your inspection, that the horse may not be rendered unquiet, either designedly, or at the mere presence of an habitual tormentor. A short time since, I had occasion to examine an animal for a friend at the stable of a considerable dealer. He was a very beautiful and well-shaped nag, but, as is commonly the hard fate of such, he appeared to have done too much work. The attendant, from a superabundant share of regard to my safety, must needs hold his head whilst I examined his legs, still assuring me he was perfectly quiet. Nevertheless, every time I attempted to feel below his knees, the horse started, and flew about the stall in a strange manner, to the no small risk of my toes and shins. Whilst I stood musing and wondering what could possibly ail the animal, I discovered a short whip under the arm of the jockey, with which he had, no doubt, tickled the neck and chest of the horse, whenever I stooped down with the intent of handling his legs. I wished this adept good morning.

"A fair quiet stable survey is a material prelude, the horse being under none of that excitement which will probably take place in him when abroad upon the show; unless, indeed, he should have been previously subject to that most barbarous stable discipline which I, too often, witnessed in days of yore; but which, I hope, does not exist at the present time—at least, not in so great a degree, or so usually disgrace the conduct of our dealers. I refer to the daily, probably hourly, attendance of a fellow with a whip, who flogs and cuts the horses up and down in their stalls, causing them to jump and fly about as if mad; keeping them in such a constant state of apprehension, that they dread the approach of any human

being. The motive of this was to render them active, ready, and lively on a show, and to hide defects; and, as an exaggeration of this monstrous barbarity, the unfortunate cripples had even an additional share of this discipline, being whipped and beaten most cruelly for putting out, in order to ease, a crippled limb. This was a constant practice at the repositories, with the poor worn-out machiners and post hacks; and I have related, in my own treatise, the case of a beautiful mare—so totally worn out, that every step she took was obviously attended with acute torture—whipped, and cut, and beaten, and checked with the curb, with all the force that a powerful ruffian could exert, whilst the tears were dropping from her sightless eyes."

To return. The horse being led out, will most probably be placed upon rising ground, for the purpose of showing his fore quarters to advantage, which, also, affords the buyer an opportunity of another examination in a good light. Now is the time for regarding whether he be sound or not; for though the dealer may declare that he is as sound as a *bell*, still we should disregard what he may say on that subject, and judge for ourselves.

Having spoken of the eyes, we must now regard his wind. If good, on being nipped in the gullet, he will utter a noise that cannot fail to strike the ear as the emission of a sound pair of lungs; but if these are diseased, he will give vent to a dry, husky, short cough. We have, however, seen a strong man sometimes pinch the gullet of a horse with all his might, without being able to make him cough. There is another way of detecting a broken-winded animal, and that is by directing attention to his flanks; which, under such circumstances, will work either much quicker than ordinarily, or heave deeply, and with great irregularity.

Besides these, there are two other defects, which, though not anything like so distressing to the animal itself, are disagreeable to hear. Those horses affected with them go under the denomination of "whistlers," and "roarers." The first may be known by the peculiar wheezing he is addicted to, when put to sudden or long-continued exertion; and the other by his making a roaring noise under similar circumstances. Either will display itself by the purchaser giving him a smart cut with his whip.

After making certain that there is no enlargement of the glands, that the nostrils are free from any fœtid smell, and that that most terrible of all diseases, the glanders, may not be apprehended, pass the hand down his legs, and if any unnatural protuberance or puffiness is found, or if, in feeling first one leg and then the other, any difference between them is discovered, disease, more or less, is present. The animal may not be lame, but he is not *clean* upon his legs. Splints, windgalls, and ringbones, may be present without occasioning lameness; but they are all unnatural, are considered blemishes, and are all to be regarded with a suspicious eye, as either denoting past hard work, or betokening future evils. On the same principle, a horse may have a spavin, and be only stiff from it at starting; or he may have a curb, or a thorough-pin, and be perfectly sound; but these are still blemishes, and, as such, detract from his intrinsic value.

The horse is next trotted in hand, or ridden; during which, the first look-out will be to discover whether he bends his knees sufficiently, and goes clear of both hind and fore legs; whether he goes wide enough behind, and whether his feet stand straight. His reining may then be observed, to see in what state he carries his head, whether he appears light in hand, or otherwise. Should he thrust out his head, he will go heavy in hand. The mode in which he is shod should also be well observed. A second-hand horse, or one which has been a considerable time in work, may be warranted sound; but care should be used to observe whether he knuckles with bent knees, or has any other impending cause of unsoundness. Animals which appear stale and dingy in their coats, with perhaps a mixture of grey hairs; and one low in flesh, and dull, with his coat dead, may be suspected of rottenness. There may be no objection to buying a horse merely because he is low in condition. The appearance of such an animal will be readily perceived; and a horse merely suffering from not having had a kind and generous master, ought not to prove an impediment to his again having one. Indeed, we have often felt great pleasure in restoring a horse which has suffered from neglect, to good condition. Many a good one has been restored, even after he had been sent to the knackers.

A naturally vicious horse will show his disposition in the designing glance of his eyes, and by laying back his ears. It is true, the kind and playful horse will lay down his ears; but he will not be a very skilful physiognomist who cannot easily discriminate between the countenance of a vicious and a playful one. The wicked and resolute expression of the one is generally so determinedly indexed, that there are but few men who will not instantly discover it. It is hardly necessary to caution our readers against the purchase of such an animal.

These various examinations of the intended purchase may probably give satisfaction, as far as the eye is concerned; yet there may be solid objections to be adduced against their being made final. The horse has now been shown to every advantage by the seller. He has been ridden by a jockey, accustomed, by his profession, to make the most of any animal he has to show; by one whose able hands and habitual use of the spurs, do not fail to command the most implicit obedience from the animal, and which will make him put his best foot forward. A buyer, expecting to find the accomplishment of all this under his own management of the horse, may find himself very unpleasantly deceived. Many horses are occasionally restive when mounted by a timid rider, and have cunning enough, very soon, to ascertain that fact; while, with a good and fearless rider, they will go quietly.

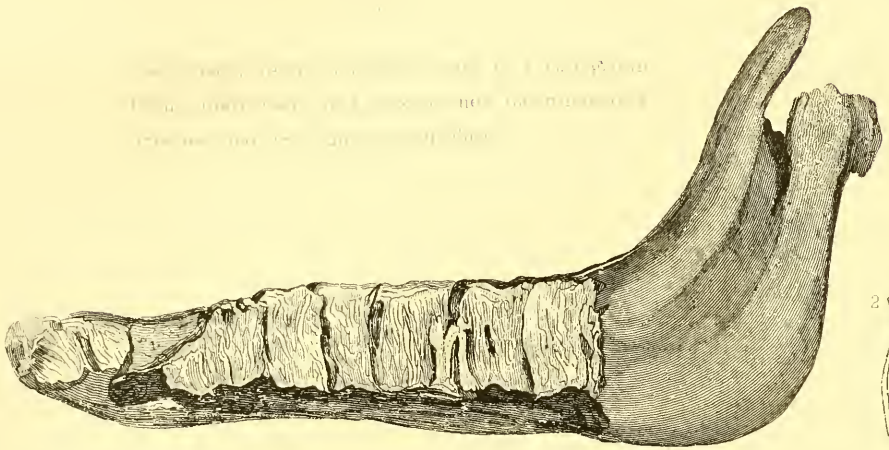
We should always recommend, before the buyer pays his money, that he should claim the privilege of riding the animal several miles on the high road, in his walk, trot, canter, and gallop, and then judge for himself whether he is likely to suit him in his paces or not. It should be remarked, that the wind and condition of horses made up for sale, must not be put to immediate and too severe tests; and if wanted for hard work, should have sufficient preparation by moderate daily exercise, and purging, if necessary.

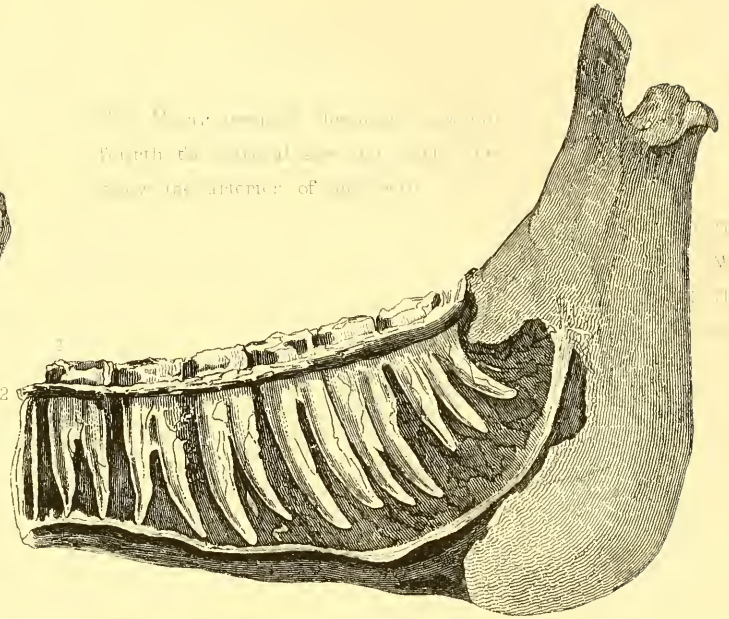
We have purposely refrained from alluding to the teeth till now, these being incontestably the parts of the body capable of furnishing the most certain indications of the number of years that the animal has lived; and the incisors, or nippers, in particular, are here our best informants. They are, indeed, the only teeth that give correct ideas of the age of the horse throughout almost the entire duration of his life. The difficulty of examining the molars or grinders, and the irregularity of their table, prevent our being able to obtain any result from their inspection. The period of the protrusion of the tushes varies much; and they do not rub against each other, but sideways and across, and can only be considered as an accessory means of judging. Besides, the mare is not always provided with them.

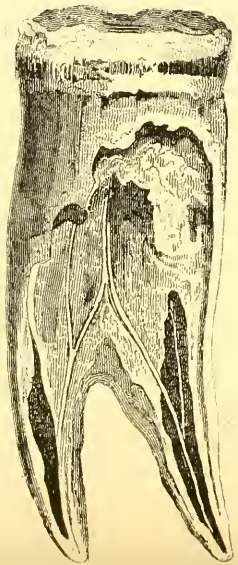
Professor Owen, in his treatise on *The Principal Forms of the Skeleton and the Teeth*, says, that teeth, like bone, are the result of the combination of certain earthy salts with a pre-existing cellular basis of animal matter. "The salts are nearly the same as those in bone, but enter in a larger proportion into the composition of the tooth, and render it a harder body. So composed, teeth are peculiar to the back-boned—vertebrate—animals, and are attached to parts of the mouth, commonly to the jaws. They present many varieties as to number, size, form, structure, position, and mode of attachment; but are principally adapted for seizing, tearing, dividing, pounding, or grinding the food. In some species they are modified to serve as formidable weapons of offence and defence; in others, as ends in locomotion, means of anchorage, instruments for uprooting or cutting down trees, or for transport and working of building materials. They are characteristic of age and sex; and in man they have secondary relations, subservient to beauty and speech.

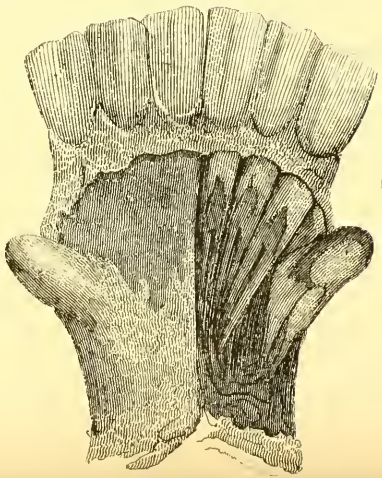
"Teeth are always related to the food and habits of the animal, and are therefore highly interesting to the physiologist. They form, for the same reason, important guides to the naturalist in the classification of animals; and their value, as zoological characters, is enhanced by the facility with which, from their position, they can be examined in living or recent animals; whilst the durability of their tissues renders them not less available to the palæonthologist in the determination of the nature and affinities of extinct species, of whose organisation they are often the sole remains discoverable in the deposits of former periods of the earth's history.

"The substance of teeth is not so uniform









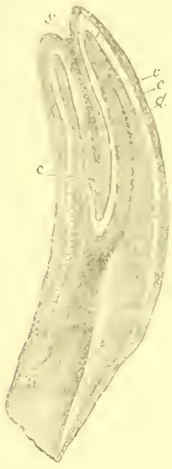
as in bone, but consists commonly of two or more tissues, characterised by the proportions of their earthy and animal constituents, and by the size, form, and direction of the cavities in the animal basis, which contain the earth, the fluid, or the vascular pulp.

"The tissue which forms the body of the tooth is called 'dentive.'

"The tissue which forms the outer crust of the tooth is called the 'cement.'

"The third tissue, when present, is situated between the dentive and cement, and is called 'enamel.'"

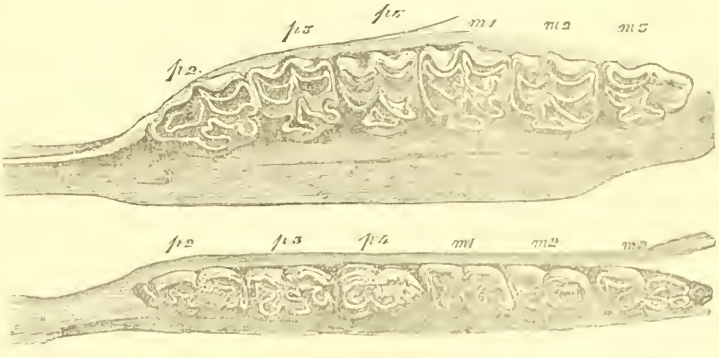
The teeth called compound, or complex, in *mammalia*, differ, as regards their composition, only by the different proportion and disposition of constituent tissues. The accompanying cut is the longitudinal section of the incisor of a horse; *d* is the dentive, *e* the enamel, and *c* the cement, a layer of which is reflected into the deep central depression of the crown; *s* indicates the coloured mass of tartar and particles of food which fill up the cavity, forming the "mark" of the horse-dealer.



SECTION OF HORSE'S INCISOR.

In pursuing this interesting subject still further, we find that the variety in the pattern of the folds of enamel that penetrate the substance of the tooth, and add to its triturating power, is almost endless; but it would seem that the folds have an invariable tendency to a transverse direction across the crown of the tooth in the rodents. This direction relates to the shape of the joint of the lower jaw, which almost restricts it to horizontal movements to and fro, during the act of mastication. In the true-hoofed herbivorous animals, in which the joint of the lower jaw allows a free rotatory movement, the folds of enamel take other forms and directions, with modifications, constant in each genus, and characteristic of such. In another part of his work, Professor Owen selects the horse as an example of such herbivorous dentition.

The grinding teeth of this animal are "six in number, on each side of both upper and lower jaws, with thick, square crowns of great length, and deeply implanted in the sockets; those of the upper jaw being slightly curved. When the summit, or exposed ends, of these teeth begin to be worn down by mastication, the interblended enamel, dentine, and cement, show the pattern figured in the accompanying engravings. It is penetrated within by a valley, entering obliquely from behind forwards, and dividing into, or crossed by, the two crescentic valleys, which soon become insulated. There is a large lobe at the end of the valley. The outer surface of the crown is impressed by two deep longitudinal channels. In the lower jaw the teeth are narrower, transversely, than in the upper jaw, and are divided externally into two convex lobes, by a median longitudinal fissure; internally they present three principal, unequal convex ridges, and an anterior and posterior narrower ridge. All the valleys, fissures, and folds, in both upper and lower grinders, are lined with enamel, which also coats the whole exterior surface of the crown. Of the series of six teeth in each jaw, the first three, *p* 2, 3, 4, are premolars; the rest, *m* 1, 2, 3, are true molars, used for the purpose of grinding the food."



GRINDING SURFACES OF THE UPPER AND LOWER MOLARS OF A HORSE.

The accompanying plates show the appearance of the teeth at different ages, and indicate the age of an animal by their form and marks.

Fig. 1 shows the end of a jaw which marks four years and a-half old. The horse-dividers newly shot out, are still quite fresh, and not as yet on a level with the incisors or nippers. The inner edge of the latter are still untouched, and lower than the external edge. The sucking corner teeth are much more worn, and present only the extremity of the funnel.

Fig. 2 shows a horse just closing up to five years old. The corner teeth have appeared a short time, and are quite fresh and untouched. The nippers begin to lose the mark; the external edge of the dividers has undergone some wear; but the inner edge is nicked, and as yet untouched, and lower than the outer.

Fig. 3 represents the age of a six-year-old. The nippers have lost their mark; the dividers have nearly lost theirs; but the inner edge of the corner teeth is still untouched, and also slightly nicked.

Fig. 4 exhibits a jaw, in which the incisors, or nippers, mark seven years old complete; and both the nippers and dividers have entirely lost the mark; the inner edge of the corner teeth is on a level with the outer, in consequence of the tear and wear they have undergone.

Fig. 5 shows an eight-year-old: all the teeth have lost the mark, and the nippers have begun to assume the oval form. The remainder of the funnel is close to the inner edge of the table of the tooth.

Fig. 6.—This engraving is taken from the teeth of a horse that was eight years old off. All the incisors have lost the mark, and the septum of the root appears on the table of the nippers, in the shape of a small transverse zone, situated in front of the funnel, and quite close to the outer edge of the tooth.

Fig. 7 exhibits the mouth at nine years old. The incisors or nippers are rounded, and the dividers have likewise begun to assume a rounded form. The remainder of the funnel of these four teeth is round, and quite close to the inner edge of the tooth. These teeth also show the septum of the root, which is most prominent in the nippers.

Fig. 8 exhibits the mouth of a ten-year-old. Here we see merely the rudiment of the funnel in the nippers, as well as in the dividers; whilst the remainder of the central enamel touches the inner edge of the table of the tooth. The nippers and the dividers are rounded, and the corner teeth present an oval form.

Fig. 9.—From the appearance of the teeth, as here represented, the horse has attained his eleventh year. All the incisors are rounded, and now carry only a slight trace of the central enamel, which touches the inner edge of the table of the tooth. The septum of the root appears in all the teeth, and the remainder of the funnel is smaller in the nippers than in the dividers and corner teeth.

Fig. 10 shows the mouth of a twelve-year-old, the nippers having lost the central enamel, and the septum of the root being rounded.

Fig. 11—This engraving is taken from the mouth of a horse thirteen years off. The nippers have become triangular; the dividers are also assuming that form, and the corners are still rounded. The septum of the root is rounded in the four latter, and is seen in the middle of the table. The tushes are very much worn.

Fig. 12.—The horse to which this mouth belonged, might have been thirteen or fourteen years of age. The nippers are triangular, and the dividers are becoming so. The tushes are still more worn than in the preceding figure.

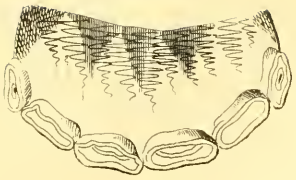
We will now briefly recapitulate the most important points to be attended to, in this chapter, in the purchase of a horse. However, it must be borne in memory, that

> "Whoe'er expects a perfect horse to see,
> Expects what never was, or is, or e'er shall be."

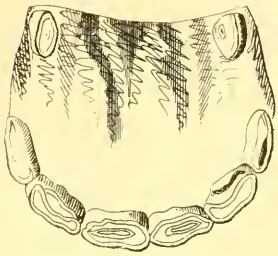
It is well known that there is a general idea in the minds of many, that a horse begins to decay after he has attained his eighth year. Than this nothing can be more absurd. Mr. Blaine remarks, that "a very considerable attention to the subject, over a wide field of observation, has impressed the writer with the propriety of drawing the following comparison between the ages of horses and men; that is, at these several periods of comparison, the constitutions of horses and of men may be considered as in an equal degree of perfection and capability for exertion, or of debility and decay, according as youth or age preponderates. Thus the first five years of a horse may be considered as equivalent to the first twenty years of a man; or thus—a horse of five years may be comparatively considered as old as a

AGE of the HORSE.

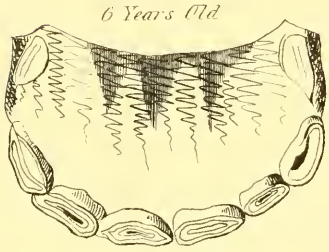
4 ½ Years Old



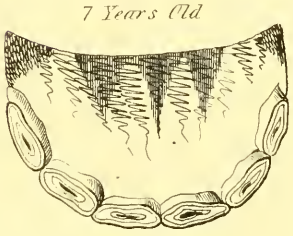
Coming 5 Years Old



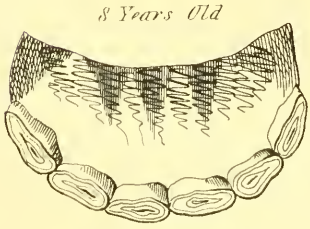
6 Years Old



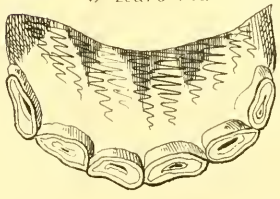
7 Years Old



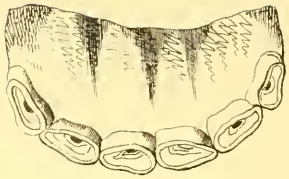
8 Years Old



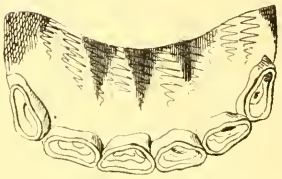
9 Years Old



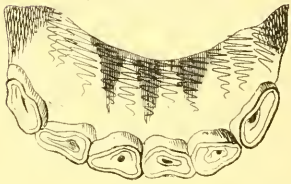
10 Years Old



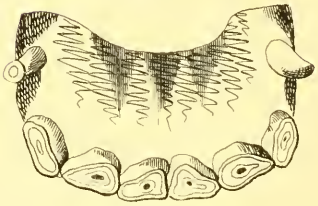
11 Years Old



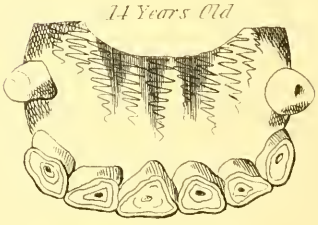
12 Years Old



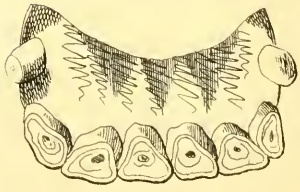
13 ½ Years Old



14 Years Old



15 or 16 Years Old



man of twenty; a horse of ten years, as a man of forty; a horse of fifteen, as a man of fifty; a horse of twenty, as a man of sixty; of twenty-five, as a man of seventy; of thirty, as a man of eighty; and of thirty-five, as a man of ninety. So far from this comparison being too much in favour of the horse, we are disposed to think it too little so. Horses of thirty-five years of age are as common as men of ninety, provided it be taken into the account that there are, at least, fifty human subjects to every horse; and unquestionably, a horse of forty-five is less rare than a man of one hundred and ten."

In enumerating the qualities to be attended to in the purchase of a horse, Professor Stewart gives the following summary:—

THE HEAD.—For the eyes; for cataract, glass eyes, and specks. The nostrils; for glanders, tumours, and cold. The glands between the branches of the lower jaw; for enlargement. The throat; for mark of crib-biting strap, and the tenderness which accompanies cold. The teeth; for the age and marks of crib-biting. The veins of the neck; to see that both are entire.

THE FORE LEG AND SHOULDER.—The seat of the collar; for tumours. The point of the elbow; for tumours. The knee; for blemishes and stiffness of that joint. The shank; for speed-cut, splint, and strain. The fetlock-joint; for enlargement, mud-galls, neurotomy, string-halt, and marks of cutting. The pastern; for ringbone.

THE FOOT.—For side-bones; sand-crack, contraction, thrush, corns, and flat-soles. The shoe; for signs of cutting.

THE TRUNK QUARTERS.—Each side of the chest; for marks of blisters and rowels. The space between the fore legs; for the same. The stifle; for enlargement. The groin; for rupture.

THE HOCK.—For capped-hock; thorough-pin, bone-spavin, and bog-spavin—not blood-spavin. Then the horse should be mounted and ridden a few hundred yards at a gallop, in order to quicken his breathing, and thereby display the presence or absence of roaring, thick wind, or broken wind.

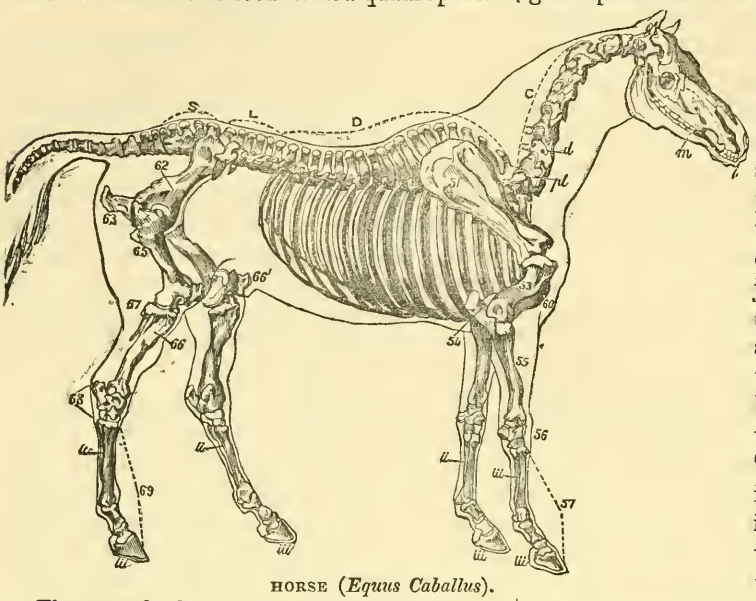
As to the prices to be given for certain horses, Lord William Lennox says, that a hunter of the best description, if in a dealer's possession, should be about £150, the odd £50 to be more or less as the horse appears to be worth it. A strong and likely hack, £40 to £60. No more should be given for this sort of animal, as good ones can always be got at that price. A horse for general work—that is, either for the field or in harness, £60 to £80, a little more or a little less, in accordance with the apparent qualities of the animal. From these prices, he says, "you must resolve not to deviate easily."

CHAPTER IX.

SKELETON OF THE HORSE; HIS ZOOLOGICAL CLASSIFICATION.

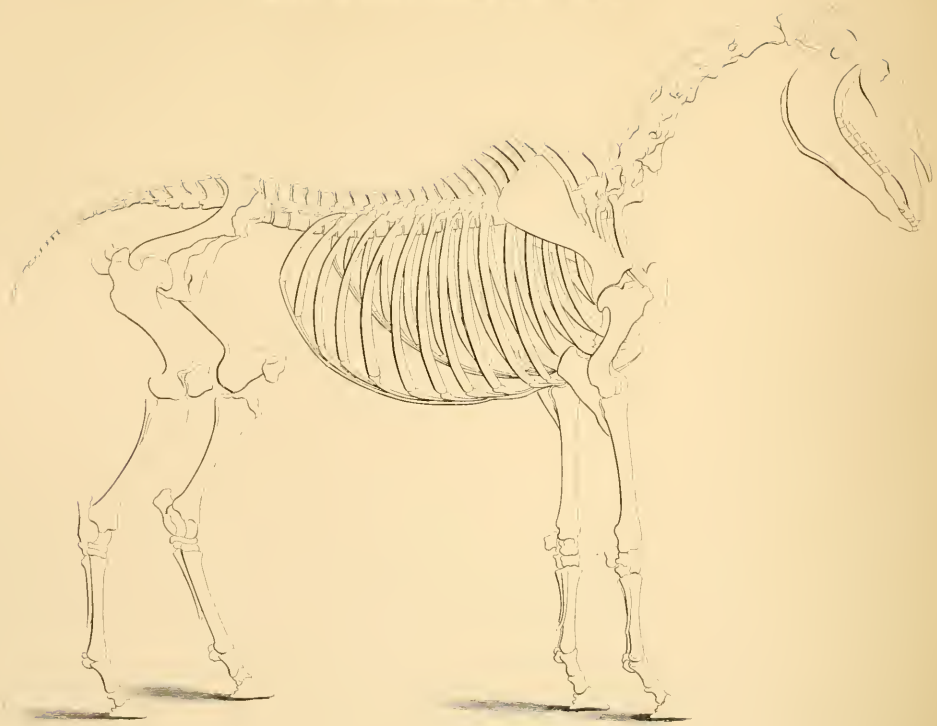
IN his Introduction to his great work on Natural History, Buffon remarks, that it is only by comparing that we can judge; and our knowledge turns entirely on the relations that things bear to those which resemble them, and to those which differ from them; so if there were no animals, the nature of man would be far more incomprehensible than it is. The truth of this is made at every step we take in the science of comparative anatomy, which, from time to time, has revealed the most unanticipated wonders relative to the most extraordinary resemblances in the structure of animals perfectly distinct. For example: who would, beforehand, expect that the same bones would be found in the horse as in the seal? Yet a comparison of their skeletons demonstrates this to be the case to a very great degree. Of all animals, the rhinoceros, rather than the camel or the dromedary, has the nearest affinity to the horse;

although a different modification of the entire skeleton may be traced in the animals with toes in even number, as compared with the horse and other odd-toed hoofed quadrupeds.



HORSE (*Equus Caballus*).

The vertebral formula of the horse is—7 cervical, C; 19 dorsal, D; 5 lumbar, L; 5 sacral, S; and 17 caudal. Eight pairs of ribs directly join the sternum, 60, which consists of seven bones and an ensiform cartilage. The neural arches of the last five cervical vertebræ expand above into flattened, subquadrate, horizontal plates of bone, with a rough tubercle in place of a spine; the zygapophyses, *z*, are unusually large. The perforated transverse process sends a pleurapophysis, *pl*, downwards and forwards, and a diapophysis, *d*, backwards and outwards, in the third to the sixth cervicals inclusive; in the seventh the diapophysial part alone is developed, and is imperforate. The spinous processes suddenly and considerably increase in length in the first three dorsals, and attain their greatest length in the fifth and sixth, after which they gradually shorten to the thirteenth, and continue of the same length to the last lumbar. The lumbar diapophyses are long, broad, and in close juxtaposition; the last presents an articular concavity, adapted to a corresponding convexity on the fore part of the diapophysis of the first sacral. The scapula, 51, is long and narrow; and, according to its length and obliquity of position, the muscles attached to it, which act upon the humerus, operate with more vigour; and to this bone the attention of the buyer should be directed, as indicative of one of the good points of a horse. The carocoid is reduced to a mere confluent knob. The spine of the scapula, 51, has no acromion. The humerus, 53, is remarkable for the size and strength of the proximal tuberosities, in which the scapular muscles are implanted. The joint between it and the scapula is not fettered by any bony bar connecting the blade-bone with the breast-bone; in other words, there is no clavicle. The ulna, represented by its olecranal extremity, 54, is confluent with the radius, 55. The os magnum, in the second series of carpal bones, 56, is remarkable for its great breadth, corresponding to the enormous development of the metacarpal bone of the middle toe, which forms the chief part of the foot. Splint-shaped rudiments of the metacarpals, answering to the second, *ii*, and fourth, *iv*, of the pentadactyle foot, are articulated respectively to the trapezoides and the reduced homologue of the unciforme. The mid-digit, *iii*, consists of the metacarpal, called "cannon-bone," and of the three phalanges, which have likewise received special names in veterinary anatomy, for the same reason as other bones have received them in human anatomy. "Phalanges" is the general term of these bones, as being indicative of the class to which they belong; and "hæmapophyses" is the general term of parts of the inferior arches of the head-segments; and just as from the modifications of these hæmapophyses, they have come to be called "maxilla," "mandibula," "ceratohyal," &c.; so the phalanges of the horse's foot are called—the first, "great pastern bone;" the second, "small pastern bone;" and the third, which supports the hoof, the "coffin-bone;" a sesamoid ossicle between this and the second, is called the "caronary." The ilium, 52, is long, oblique, and narrow, like its homotype, the scapula;



the ischium, 63, is unusually produced backwards. The extreme points of these two bones show the extent to which the bending muscles and extending muscles of the leg are attached; and, according to the distance of these points from the thigh-bone, the angle, at which they are therein inserted, becomes more favourable for their force. The longer, therefore, and the more horizontal the pelvis, the better the hind-quarter of the horse; and its qualities for swiftness and maintenance of speed, depend much on the "good point" due to the development of this part of the skeleton. The femur, 65, is characterised by a third trochanter springing from the outer part of the shaft, before the great trochanter. There is a splint-shaped rudiment of the proximal end of the fibula, 67, but not any rudiment of the distal end. The tibia, 66, is the chief bone of the leg. The heel-bone, "calcaneum," is much produced, and forms what is called the "hock." The astragalus is characterised by the depth and obliquity of the superior trochlea, and by the extensive and undivided anterior surface, which is almost entirely appropriated by the naviculare. The external cuneiforme is the largest of the second series of tarsals, being in proportion to the metatarsal of the large middle digit, *iii*, which it mainly supports. The diminished cuboides articulates partly with this, partly with the rudiment of the metatarsal, corresponding with that of the fourth toe, *iv*. A similar rudiment of the metatarsal of the toe, corresponding with that of the second, *ii*, articulates with a cuneiforme medium—here, however, the innermost of the second series of tarsal bones.

In the zoological classification of the horse, he is placed in the division vertebrata—the class mammalia—the tribe ungulata—the order pachydermata—and the family solipida. The generic character is, front teeth, in the upper jaw, six, parallel; in the lower jaw, six, somewhat projecting; canine teeth, one on each side, in both jaws, remote from the rest; feet with undivided hoofs.

Of the solipida, there are several species, as the horse, the ass, the mule, the zebra, and the quagga.

Equus Caballus is the common horse.

Equus asinus, the ass, which has long been condemned to a state of the lowest servitude, and considered as a species of less dignity than the horse; and has acquired, in most parts of Europe, a character of contempt. In its natural state, however, it exhibits an appearance superior both in beauty and vivacity. It is a native of Asia, living, like the rest of this genus, in a gregarious manner. It is also said to be found in Africa, but very rarely in Syria and Arabia, where it was, in ancient times, extremely common. In its natural state its colour is white, or a very pale silver grey, with a tinge of straw-colour on the sides of the neck and body. Along the back runs a deep brown stripe of thickish wavy hair, to the beginning of the tail. This stripe is crossed over the shoulders, as in the tame animal, by another of similar colour; but it is said that this is peculiar to the male.

The food of the wild ass consists chiefly of saline, or bitter and lactescent plants. It is also fond of salt or brackish water. The manners of these animals very much resemble those of the wild horse. They assemble in troops, under the conduct of a leader or sentinel, and are extremely shy, vigilant, and swift.

The *mule* is nothing more than a hybrid animal, between this species and the horse; differing in strength, size, and beauty, according to the predominancy of its parental species. Mules are little used in this country; but in Spain and some other parts of Europe they are in much esteem, and are remarkably sure-footed.

Equus zebra, or the zebra, is a native of the hotter parts of Africa, being found from Æthiopia to the Cape of Good Hope; living in large herds, and possessing much of the manners both of the wild horse and the ass. It is both extremely swift and vigilant. It is of a wilder disposition than either of the former animals; and even such as have been taken very young, are with difficulty brought to any degree of familiarity, and have rarely been made to submit to the bridle.

Equus quagga, or the quagga, is nearly allied to the zebra, but marked with fewer and larger bands, of a brown colour, and chiefly disposed on the fore parts of the animal, while the hinder parts are spotted. The ground-colour of the quagga is of ferruginous tinge, especially on the thighs and back. It is of a more docile

nature than the zebra, and is said to have been domesticated at the Cape. It inhabits the same parts of Africa as the zebra, but is found in separate herds, never associating with that species, perhaps on account of the inherent ferocity of the latter.

CHAPTER X.

SPLINTS; BONE-SPAVIN; RINGBONE; ANCHYLOSIS.

SPLINTS.

Splints are bony excrescences, situated on the inside of the fore leg, and rarely occur on the outside, in consequence of that part in the structure of the horse being more under his direct weight. When the horse has one of his fore legs off the ground, there is more weight thrown on the inside of the leg that is on the ground; consequently, the small inside bone united to the shank bone has more work to perform than the outer one, from the superabundant weight it has to sustain; hence inflammation frequently begins in the attachment of the large to the small bone, which is of a cartilaginous substance, and, on the slightest exertion, readily assumes a disposition to form bone. But *splint* will frequently occur in horses that never have done a day's work. Even when young, and racing about the fields at grass, splint will be produced; but when this happens from such a cause, it seldom produces lameness, as the coolness of the atmosphere in which they are kept acts as a sedative, and reduces the inflammation. Splints arising from travelling, exhibit much more inflammation than they do when they arise from the cause just mentioned. This is frequently caused by the warmth of the stable in which the horse has to lie; and although the disease may not have assumed a form above half the size of a pea, it will be the means of producing the most painful lameness. Another cause of splint is occasioned by the speedy-cut, which is just under the knee. This has been known to proceed so far, that valuable horses, good hackneys, have been doomed by it to slow work during the remainder of their lives. The cause of this is from its interfering with the bones of the knee, or proceeding inwards, and thereby affecting the suspensory ligament. The remedies for splints are now more humane, and have a better effect, than those formerly in use. The practice at the Royal Veterinary College, is to divide the skin above and below the enlarged bone; then to pass a seton immediately over it, changing and dressing the seton, consisting of coarse tape, every day with a digestive ointment, composed of the following ingredients:—

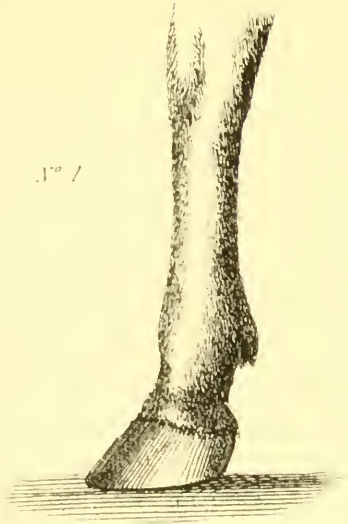
Hog's Lard	6 oz.
Common Turpentine	2 „

Another method practised at the College was to cut down on the top of the splint, and divide the *periosteum*, or the membranous skin-like substance immediately attached to the bone; the stretching of which, in consequence of the bony excrescence or splint, is the cause of the lameness. These remedies, however, though practised at this royal establishment, are not calculated for practice either in town or country, as both of them leave a considerable *blemish*, which always deteriorates the value of the horse. The following mode of treatment leaves no blemish, and is generally successful. If the case is a recent one,

Spirit Turpentine	1 oz.
Olive Oil	2 „

Rub this well on the part, night and morning, and wind a woollen bandage moderately tight round the leg. By removing the ordinary shoe, and putting on a thick-heeled one, it will greatly relieve the affected part. Should the lameness not disappear in the course of three days, then some stronger application

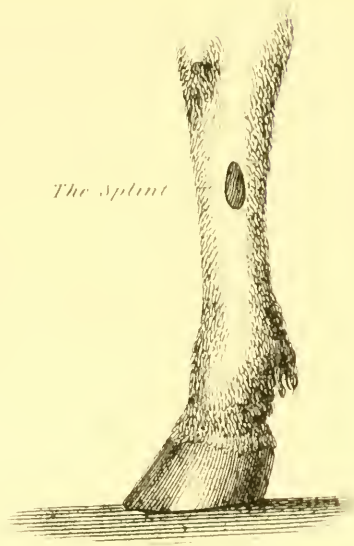
a



N° 1

The Healthy Leg representing the inside below the knee

b



The Splint

The inside of the fore leg representing the situation of splint

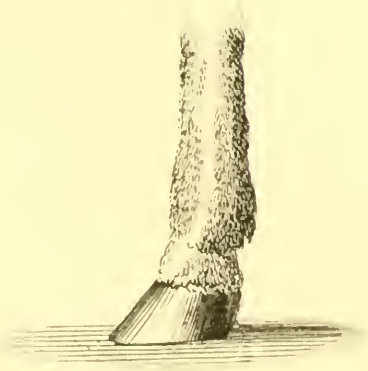
c

The Seton passing over the Splint

The Splint

Method of treating Splints at the Royal Veterinary College

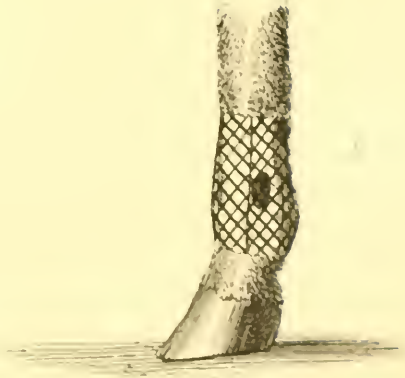
WIND GALLS.



The fore leg free from Wind galls

A

A The Wind gall either to be opened or have the mercurial plaster applied



B Method of treating the Wind galls as round the leg

must be made, more especially if the splint is large.

Mercurial Ointment . . . . 1 oz.

Rub a piece of this, about the size of a hazle-nut, on the part, morning and night, as long as any remains: then apply

Blister Ointment . . . . . 2 drachms.

By this method of practice splints will be got rid of without the fear of blemish or injury to the leg. If there is an obligation to have recourse to the last remedy above named, have *a cradle* on the neck of the horse, as he may, by biting it, be kept more safe from blemish.

During the application of the local remedies, take of—

Cape Aloes . . . . . 6 drachms.
Resin, powdered, ... 6 „
Common soap, to form into a mass.

Divide into three balls, and give one every second day. For food, give half bran and half corn, made moderately wet. Mr. Youatt says, that if splints are worth while to meddle with at all, their treatment is very simple; and recommends the hair to be closely shaved off round the tumour—the application of a little strong mercurial ointment rubbed in for two days, to be followed by an active blister. If the splint is of recent formation, it will generally yield to this, or to a second blister.

Professor Sewell introduced a new treatment of splints. He removed any inflammation about the part by fomentations or poultices, and then performed the following operation. He commenced by pinching up the skin immediately above the bony enlargement, with the finger and thumb of the left hand; and with the knife, or lancet, or scissors, made an orifice sufficient to introduce a probe-pointed bistoury, with the edge on the convex side. This he passed under the skin the whole length of the ossification beneath, cutting through the thickened periosteum down to the bone. This being satisfactorily completed, he drew the knife several times backwards and forwards—inserting a small tape or seton, which, if the tumour was of long standing, was kept in a few days. This operation is attended with very little pain to the animal.

BONE-SPAVIN.

This is an exostosis or bony enlargement in or about the inner part of the hock joint; but more particularly at its lower part; or, in some cases, at the upper end of the leg bone, though spavin may occur on any part of the hock. From the peculiar construction of the hock joint, the number of bones which are there, and its being the seat whence the principal propelling motion arises, it is little to be wondered at, that horses are so very liable to spavin. Young animals are especially subject to it, in consequence of farmers and breeders putting them to work at too early a period. Farmers generally commence using their young horses in the summer, to assist in drawing their hay or bringing in their corn. Now, as colts pull awkwardly at first, any sudden strain made on uneven ground, or a sudden start forwards, or from the violent exertion put on, the animal will, in all probability, strain his hock. This being a very complicated joint, any of these causes may produce considerable inflammation, lameness, and spavin; though there are a great number of horses affected with what is termed spavin, that never go lame at all, and some of them even very excellent hunters. This arises from the situation in which the bony enlargement has it seat. If it is at the upper end of the leg bone, and in such a situation as not to interfere with the small bones of the hock joint, it may grow to a very considerable substance, and but slight lameness exist. Should this be the case, the treatment of spavin may consist in the use of gentle counter-irritants, which invariably remove the lameness in a very short time. Cooling lotions or repellers, as they are exceedingly slow in their operation, and seldom or ever restore the horse from lameness, are not to be recommended. In colts, however, the mildest methods should be preferred, though their effects are much slower. For a mild application, take—

Cantharides, powdered . . . 4 drachms.
White Wine Vinegar . . . . 4 oz.

Put these into a six-ounce bottle, and let the mixture stand three or four days, shaking the bottle four or five times a day. At the expiration of that time it will be fit for use.

Rub about two table spoonfuls of the lotion on the hock night and morning, shaking the bottle well each time. Should this not have the desired effect, apply a

Strong Blister.

Cantharides, powdered . . .	6 drachms.
Mercurial Ointment	4 „
Hog's Lard	2 ounces.

Clip the hair off close, say an inch and a-half further round than the spavin extends. Rub the blister well in with the hand. In all probability this blister will remove the spavin entirely, or at least the pain and lameness; for, when once bony matter is formed, it is difficult to completely remove it. Be careful that the horse wears a cradle in every case of blistering.

Some spavins may require a second or third blister. In such cases repeat the above at an interval of about three weeks—not earlier—to prevent the chance of having a blemish.

With full-grown horses, as well as with old ones, this disease is with difficulty remedied. As success, however, sometimes attends even the milder methods, it should not, even at any age of the animal, deter us from trying other remedies. Bold adventurers succeed sometimes with them, where superior skill, under the direction of prudence, fails; but notwithstanding this, their more frequent ill effects, by exciting excessive pain and inflammation, and even causing death, should induce great caution in their use.

If the ointment is not effectual, recourse must be had to firing. In this operation care must be taken not to fire through the skin; for wherever this is done, a blemish will be certain to be left. Lay the following blister on lightly, but on no account let it be rubbed in, or a blemish will be the result.

Mild Blister.

Cantharides, powdered . . .	2 drachms.
Hog's lard	2 oz.

Smear this, or lay it lightly on the part fired. In the course of five weeks, should this first firing not have had the desired effect, fire again, and extend beyond the edges of the first operation, and apply the blister again. Mr. White, in his *Compendium of the Veterinary Art*, says that the only cure for this complaint is firing, and blistering immediately after.

The practice for the cure of spavins made use of at the Royal Veterinary College, is by introducing setons over the diseased part, dividing the skin above and below the spavin, about two inches; then with a blunt seton needle, introducing tapes—generally two—and dressing daily with digestive ointment, composed of the following proportions:—

Common Turpentine	3 oz.
Hog's Lard	8 do.

These are melted together over a slow fire. The setons are suffered to remain for about a fortnight, being changed daily at each dressing. In some cases a very good effect is produced by this mode; but, like all other remedies, it is not applicable to all stages of the disease; in the early or incipient state, it may be considered a good remedy. During the operation of any of the above methods of practice, the following medicine should be administered:—

Cape Aloes	2 drachms.
Linseed meal with soft soap,	

formed into a moderately sized ball. Give one about every third day. Medicine that will act on the urinary organs must not be given while using so much blistering ointment.

RINGBONE.

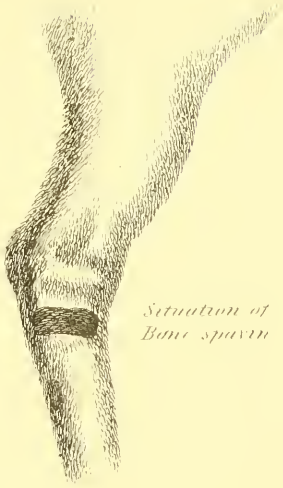
This disease takes its name from its situation, which is at or about the joint of the large and small pastern bones. From the existence of great inflammation, it spreads round the coronet, capping the hoof with a bony ring.

This is produced by the ligaments having been injured by over-exertion; and it more frequently occurs in the hind than in the fore limbs. Overweighting the animal will produce it, or putting him to work before he finished, as it is termed. Any severe strain, and even blows will produce it. And, as it is not uncommon for ill-tempered grooms or carters to kick their horses about their fetlocks, the effect of such an act may be to set up inflammation, and ultimately to produce ringbone.

Horses affected with ringbone, may or may not be lame. It all depends on that degree of inflammation which would increase the greater deposit of bony matter, and occasion the disease to spread, which it frequently will do,

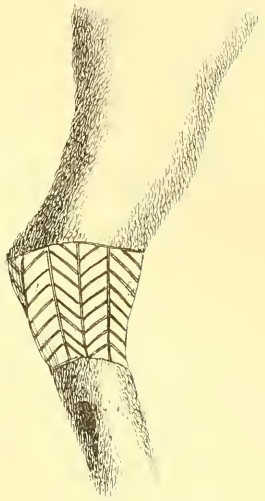
Representing the inside of the Hock joint

The Horses hock in its natural or healthy state



Situation of Bone spavin

When affected with Bone spavin



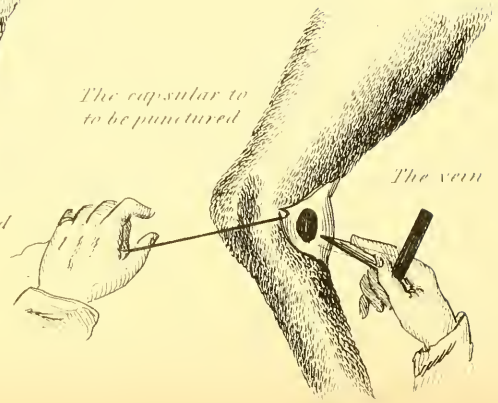
Method of prevng for Bone spavin the most effectual

BOG SPAVIN.

The Horses hock in its natural

Bog or Blood spavin.

When affected with Bog



Method of reducing the enlargement by

even so far that the coffin-bone, and the navicular, or nut-bone, partake of the disease.

"Horses with short upright joints," says the editor of *The Horse*, "and with small feet and high action, are oftenest, as may be supposed, the subjects of this disease, which is the consequence either of concussion or sprain of the pastern joints. It is also more frequent in the hind foot than the fore; because, from the violent action of the hind legs in propelling the horse forward, the pasterns are more subject to ligamentary injury behind than before; yet the lameness is not as great there, because the disease is confined principally to the ligaments, and the bones have not been injured by concussion; while from the position of the fore limbs, there will generally be in them injury of the bones to be added to that of the ligaments. In its early stage, and when recognised only by a bony enlargement on both sides of the pastern joint, or in some few cases on one side only, the lameness is not very considerable, and it is not impossible to remove the disease by active blistering, or by the application of the cautery; but there is so much wear and tear in this part of the animal, that the inflammation and the disposition to the formation of bone rapidly spreads."

If the horse should be lame, the best plan to adopt is, to relieve the vessels as near the part as possible, by bleeding in the foot to the amount of at least two quarts. After replacing the shoe, and applying a pledget of tow, administer the following ball:—

Aloes, Cape	6 drachms.
Ginger	1 do.

Form with soft soap.

Should this not be sufficient to purge the horse, increase the dose, as may be necessary, with a drachm or two of aloes, at the same time having the horse fed on bran mashes for at least a day previous. When the physic is set, apply the mercurial blister as prescribed in the case of spavin, and keep it open by occasionally applying hog's lard to the part for five or six days. In the course of three or four weeks, should the animal not have got rid of his lameness, recourse must be had to firing, which should be done at least half way up the large pastern bone, and down to the hoof, in what is called diaments. After this, lay some mild blister on; and, in most cases, the lameness will be altogether removed. If it should not, repeat the firing, and blister again.

ANCHYLOSIS.

The origin of this disease is an inflammation of the ligaments, connecting joints together, and occurring in the fore legs, particularly between the large and small pastern bones. It may also arise from sprain or laceration, as well as from various other causes, such as tumefaction of the ends of bones, caries, fracture, dislocation. As the horse becomes aged, stiffness in the joints is also apt to occur. Anchylosis, however, is a disease which more frequently occurs in the spine, or back-bone, than in any other part. When this is the case, the horse is termed rigged in the back, because he is most generally affected about the loins. The difficulty he shows in turning—giving to his body a kind of jerk, according as he may be turned either to the left or the right—has given rise to the term *rig;* and if he be trotted, he will have such a rolling gait, accompanied with such apparent weakness, that what is the matter with him is at once perceived. There are, however, many horses called *chinked in the back*, which may, in a measure, be restored, for slow work, by giving them as much rest as possible; as this kind of anchylosis of the back-bone does not interfere with the animal employed in slow farm labour. If the disease takes place in either the fetlock joints, pasterns, knee, hock, or stifle, the horse will be totally useless, and *a cure is impossible.*

CHAPTER XI.

FRACTURES.—THE HEAD; RIBS; LIMBS; BLADE-BONE; ARM; ELBOW; SHANK-BONE; THIGH-BONE; PASTERNS; COFFIN-BONE, AND NAVICULAR BONE.

FRACTURES.

Fractures mean a division of a bone into two or more parts, or fragments. A *simple* fracture is when the bone only is divided, and not protruded through the skin. A compound fracture is a division of the bone, with a laceration of the integuments, the bone mostly protruding. A comminuted fracture is where the bone is splintered in more than one direction. A fracture is also termed transverse, oblique, &c., according to its direction.

The fractures that most generally occur are in the head, occasioned by horses running violently against a post or bar; the ribs, hip-bone, thigh-bone, and, indeed, all bones of the leg, caused either by falls, or kicks from other horses. We will first consider

FRACTURE OF THE HEAD.

Although this is not a very common case, still, it is likely to occur. A case illustrative of the manner in which it sometimes happens, took place in India. At the usual watering-time of the horses in the afternoon—about five o'clock—one of them broke loose from the hands of the man who attended him. This occasioned a tremendous outcry among the soldiers, many of whom ran after him, and so frightened the animal, that he fled with all the reckless speed he could command. In this state he made a desperate rush into his standing in the stable, and fractured his skull against its top bar with such violence, that he was knocked down by the effects of the blow. He received a wound on the head about an inch wide. Fearing that concussion of the brain had taken place, the veterinary surgeon had the horse bled to the amount of six quarts, the head frequently fomented with warm water, and no food given to the animal that night. In the morning he appeared better. The fomentations were kept up, and six drachms of aloes given him. This treatment was continued for two days, when the process of healing the skin was commenced, and accomplished in about a week.

At the end of the third day, when about to discharge the horse as cured, it was found that he was attacked with *lock-jaw*. This circumstance suggested that the bone must have been fractured, and that pressure on the brain was the consequence. The horse was immediately cast, and two sections in the skin, forming two sides of a triangle, made with the scalpal. On examining the parietal bone, it was found that the skull had a perpendicular fracture of about an inch and a quarter in length, and that a piece of bone had been splintered off, about three-quarters of an inch long. The splintered bone was now extracted with a pair of sharp-pointed forceps, the skin drawn down, and half-a-dozen sutures attached. The fracture was then treated as a common wound, and dressed with digestives until granulations began to form. Under this treatment, it was completely healed in about three weeks. The lock-jaw yielded, by degrees, to copious bleedings and solution of aloes, day by day, until purgation was produced. This interesting case is represented in the accompanying Plate of the horse's head.

EXPLANATION OF PLATE.—"FRACTURES."

A shows the situation of the parietal suture, running perpendicularly up the front of the head.

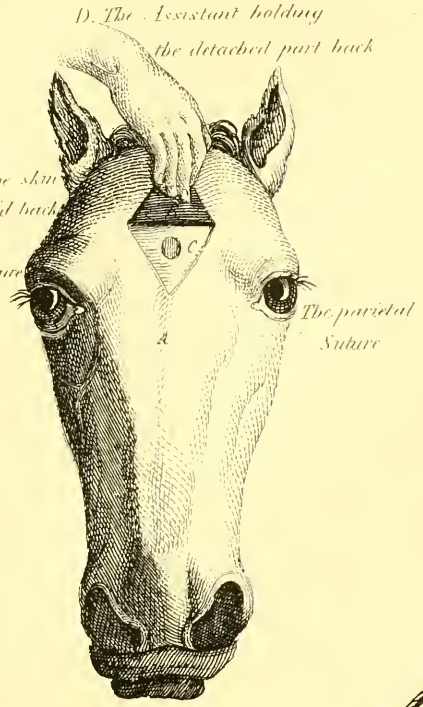
B, the fractured part, just on the suture.

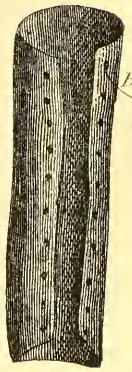
C, the skin dissected and laid back, the upper part being held in its situation by an assistant.

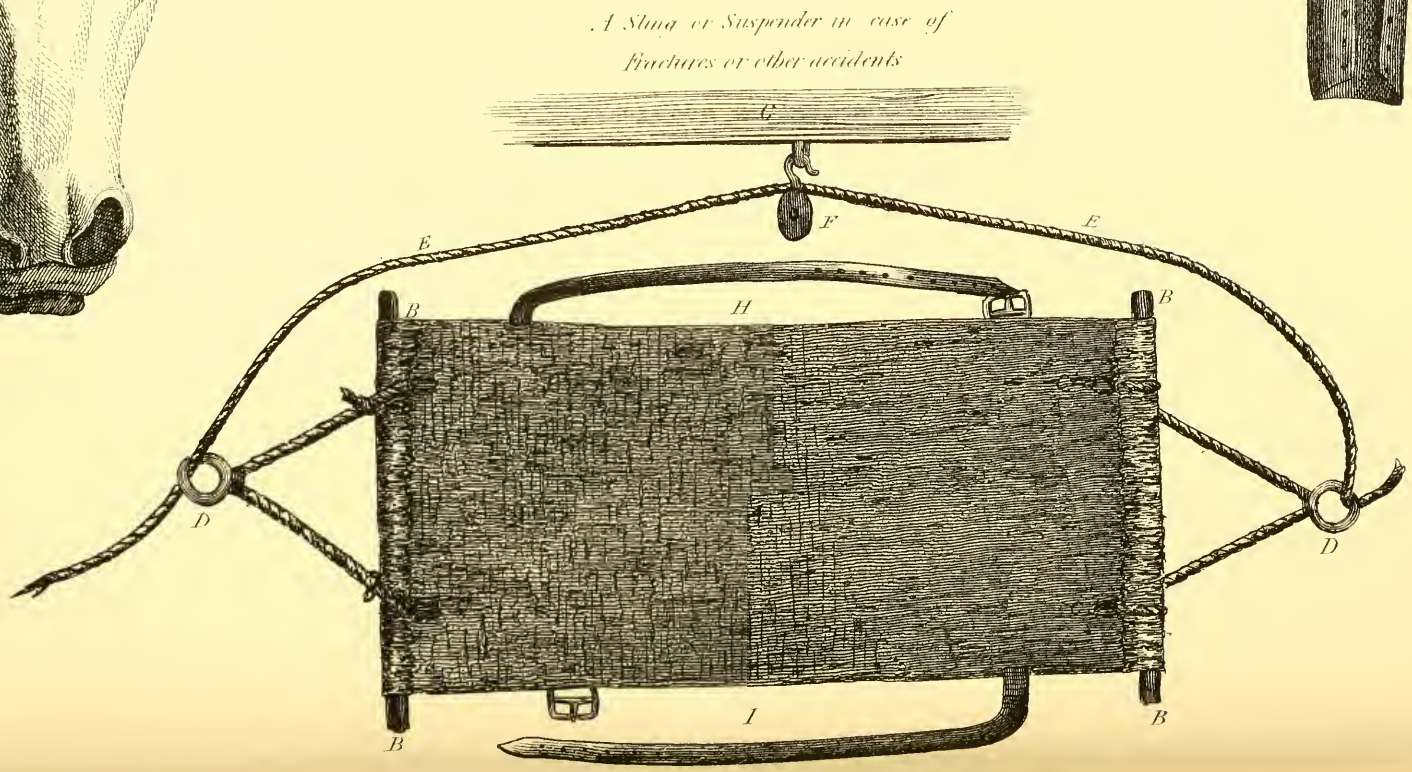
FRACTURES OF THE RIBS.

Fractures of the ribs frequently occur, and are very often produced by kicks from other horses, more especially when at grass than at

FRACTURES.


D. The Assistant holding
the detached part back
The skin
laid back
fracture
C
The parietal
Suture
A


I The Boot or laced Stocking
to be applied to a fractured leg
B The lace to be used
as in a common boot


A Sling or Suspender in case of
fractures or other accidents
G
F
E
E
B
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I
B

any other time. They are, also, frequently the effect of blows dealt to such animals as are used in large towns by costermongers and dustmen, who, if a horse cannot travel at the rate they require, a large stick is made to resound on his sides with an inhumanity only equalled by the ignorance of the brute who is entrusted with the use of such a weapon. These fractures generally unite of themselves; Nature setting up the healing process herself, and the accident seldom or ever coming to light until the beast finds its way to the yard of the knacker. "The two ribs behind the elbow," says Hurtrel d'Arboval, "are the most subject to fracture; and the false ribs, from the yielding motion which they possess, are least liable."

FRACTURE OF THE SPINE.

Fracture of the spine may arise from lying down in a narrow stall, in which there is difficulty in rising again; or sometimes from the horse turning over in the standing, whilst lying down, so that there is not room for him to get his hind legs clear of the stall-post. Where this is the case, he struggles to regain his feet, and the ligament of his back becomes so much strained, that inflammation commences, and in all probability terminates in anchylosis. It sometimes occurs in casting a horse to perform an operation, notwithstanding every possible care may have been taken to prevent it.

For this fracture there is no remedy. In the eleventh volume of the *Veterinarian*, Mr. W. C. Spooner relates a case of spine-fracture of considerable interest. A horse had been clipped about three weeks, and was subsequently sharply galloped upon rough ground, and pulled up suddenly and repeatedly, with the object of sweating him. After this, he did not go so well as he had done previously, nor would he canter readily, although he had been much used to that pace. Two days before he was destroyed, the groom was riding him at a slow pace, when he suddenly gave way behind, had to be carried home, and he could not afterwards stand. He had, it is supposed, slightly fractured the spine when being suddenly pulled up, but without displacing the bones. There are, doubtless, many similar cases to this.

Attempts have been made to cure this fracture by blisters and charges, but never with any good effect.

FRACTURE OF THE LIMBS.

As in all other cases of fracture to which the horse is liable, those of the limbs are as difficult to cure as any. Consequently, in many instances, the animal has to be destroyed; but many fractures of the limbs may be restored so far as still to make the horse of considerable value. This will especially be the case if he is a well-formed stallion, or if she is a good mare. The breed of either may not only be kept up, but may be useful for many purposes. Of a case of fracture of the tibia, Mr. J. S. Mayer gives an interesting account. A horse had received a blow on this part of the leg, but for two or three days little notice was taken of it. When he, however, was called in to examine him, he found the tibia to be obliquely fractured, about midway between the hock and the stifle, and a small wound existing on the inside of the leg. The process of setting it was as follows:—The leg, from the stifle down to the hock, was well covered with an adhesive compound, then wrapped round with fine tow, upon which another layer of the same adhesive mixture was laid, the whole being well splinted and bandaged up, so as to render what was a slightly compound fracture a simple one. The local inflammation and sympathetic fever that supervened were kept down by antiphlogistic measures. At the end of six weeks the bandages and splints were removed, and readjusted in a similar way as before; and, at the termination of three months from the time of the accident, he was discharged cured: the splints being wholly taken off, and merely an adhesive stay kept on the leg. The horse is now at work, and quite sound, there being merely a little thickening where the callus is formed.

FRACTURE OF THE BLADE-BONE.

Fracture of the blade-bone is not at all unfrequent, and particularly the neck of the bone. This is caused either by kicks, or falls when going at a fast trot; so that when the horse comes to the ground, one leg is extended before him, and the other under his body. With coach-horses, it most frequently

takes place. The remedy is, first to draw about four quarts of blood from the plate vein, at the anterior part of the leg. The animal should be slung, so that the feet just touch the ground. This being completed, bathe well with flannel dipped in hot water. Repeat this until the inflammation appears to subside. Feed with cold bran mashes, and give the following ball:—

Cape Aloes	4 drachms.
Linseed Meal	1 do.

Form with soft soap.

If this should not be sufficient to keep the system cool, repeat it in three days.

Apply the following liniment to the shoulder:—

Ol Terebinth	2 oz.
Ol Oliva	2 do.

Continue this treatment for about three weeks, then give the horse a month's run at grass, where he will be most likely to lie quiet. By the end of this time he will probably be fit for work.

FRACTURE OF THE ARM.

This bone is frequently fractured from its being so exposed and so very liable to kicks. When it occurs, however, there is a much greater probability of effecting a cure of it than there is in the fracture of the blade-bone. In treating for it, the horse must be slung lightly, as in the preceding case; but, instead of taking blood from the arm, let it be taken from the jugular vein of the neck. Treat in every other respect as directed for the foregoing; and take a piece of very broad tape, four yards long, and bind it round the fractured part tolerably tight. Let it remain on two days, then remove and apply more of the liniment; after which put the tape on again, and continue in this manner until the horse can put his foot to the ground. When he is able to do this, remove the sling, and let him have a loose box for a week or two before he is turned out.

Mr. Gloag, of the 10th Hussars, tells us of an entire black cart-horse, which was grazing in a field into which some mares had been accidentally turned. One of them kicked him severely a little above the knee. He, however, contrived to get home; and being carefully examined, there was found a simple fracture of the radius, about an inch and a-half above the knee. The ends of the fractured bone could be heard distinctly grating against each other, both in advancing the leg, and turning it sideways from the body. He was immediately placed in a sling not completely elevated from the ground, but in which he could occasionally relieve himself by standing. The leg was well bathed with warm water, and the ends of the bone brought as true to their position as possible. Some thin slips of green wood were then immersed in boiling water until they would readily bend to the shape of the knee; and they were tied round the joint, reaching about nine inches above, and six below the knee, the ends of them being tied round with tow.

FRACTURE OF THE ELBOW.

This is one of those fractures which must be united in the same manner as we have seen practised in regard to the arm. There is, however, sometimes great difficulty in keeping the limb sufficiently relaxed to accomplish this; therefore, when the horse is slung, a side line should be put on, or, as a makeshift, the end of a halter fastened round the pastern, and passed up to the sling-tackle; the foot being drawn about four inches off the ground, to relax the flexor muscles. When this is done, proceed in the same manner as recommended in the preceding practice of the arm.

Mr. Youatt recommends a large quantity of tow, saturated with pitch, to be placed round the elbow, and confined with firm adhesive plasters, the ground being hollowed away in the front of the injured leg, so that no pressure shall be made by that foot.

FRACTURE OF THE SHANK-BONE.

When a fracture of this bone takes place, it may be restored, with good management; because bandages and other compresses may be applied with greater facility, and in greater variety, after securing the horse by means of assistants. The first article to have ready is a leathern bandage something like a leathern boot, about seven inches long, with holes in it, as represented in one of the engraved sheets of this work. This must be so made, that, when it is laced, it should not touch the edges by a quarter of an inch. Being prepared with this,

place the ends of the fractured limb as evenly in contact as possible; then get an assistant to lace the boot tight on, which will act as a kind of splent, to secure the bone in its proper situation. After this, bandage the leg well from the knee to the fetlock, with four yards of a flannel bandage. Remove all straw and litter; and if much irritation appears about him, give—

Cape Aloes	4 drachms.
Resin	1 do.
Soft soap to form the ball.	

The flannel bandage must not be removed for at least a week; when a little of the liniment prescribed for the fractured blade-bone may be poured in at the top of the boot, so that it may run down between the boot and leg. Pursue this plan until the boot can safely be removed, then apply the liniment and the woollen bandage only. For food, if the animal is accustomed to the stable, give half bran and half oats made damp. If the accident occurs while the horse is at grass, give bran mashes only.

In the representative plate, A shows the form in which the boot is to be made; B B, the length from top to bottom, about seven inches; C, the lace to draw the edges together within a quarter of an inch, in order to give it the requisite tightness.

FRACTURE OF THE THIGH-BONE.

The thigh-bone is sometimes fractured at its lower head, where it joins the bones of the hock, though this is by no means a common case. There is no doubt, however, that many horses are killed from the appearance of the fracture; the leg, below where it has occurred, dangles and shakes about, as if only sustained by the common integument—or skin—so that the horse literally goes on three legs. It arises sometimes in consequence of the temper of the horse, or it may occur from a sudden slip of the hind leg on wet slippery stones, in going up hill.

A horse had got his leg entangled between the foot-board and the bar, and so near to the middle that he could not extricate it. He consequently made a sudden plunge, and snapped his thigh just above the head of the lower end of the thigh-bone. He was put into a friend's stable, hard-by where the accident happened, and the veterinary surgeon was immediately sent for. The leg was dangling as if by a piece of cord, and the horse was restless, and sweating profusely from the pain he was suffering. The treatment was as follows:—

The surgeon first got an old horse-collar, which he put on the horse; then a roller, to which was fastened the top of the collar, with a strap to prevent its getting forward on to his neck. The bow part of a halter was then put round the fetlock joint of the fractured leg, passing the other end between the fore legs of the horse, and into the collar, the end of which was given to an assistant to hold until the horse's leg was got into a proper situation. A good woollen bandage was next procured; and the gentleman to whose house the horse had been taken, fortunately happened to have by him three parts of a bottle of liniment, composed of oil turpentine and oil olive. Two table-spoonfuls of this liniment was gently rubbed on the part; then the man who held the halter was desired to draw the leg gently forward, until the parts were brought as even together as possible. This being satisfactorily accomplished, an assistant, with the bandage, bound the parts up tight and firm; after which the halter was made fast to the bottom of the collar. The bone was now replaced. The bandage was not removed for a week, when the limb was found to be doing well. The liniment was continued, and the line kept to the foot for three weeks, when the horse was able to be moved about a few yards. On account of the restlessness of the animal, no medicine could be given him, and two men sat with him day and night. His principal food was bran mashes, as a substitute. This animal being an *entire horse*, and a favourite, the owner would have him castrated, which operation was performed on him; and, on getting well, he turned out one of the best gig horses in the country.

Another case was that of a fine brown horse belonging to a gentleman residing in Red Lion-street, Holborn; and the accident occurred when going up Holborn Hill, during the frost of a winter day.

The horse was placed under the care of a very skilful metropolitan veterinary surgeon; but the owner of the horse, regretting the accident very much, wished he could get rid

of him at five pounds. The veterinary surgeon who treated the last case, bought him at that price, with a further stipulation that he should have stable-room, and a man to look after him for a month. Within that period the horse was removed to his owner's stable, whence he was turned out for another month. By this time he had become perfectly upright, and was sold for *twenty-five pounds.* During the month the horse remained with the gentleman of whom he was purchased, he underwent the same treatment as described in the other case.

FRACTURES OF THE PASTERN BONE, THE COFFIN-BONE, AND NAVICULAR BONE.

There is no remedy for these. When the fracture is in the lower pastern, and of neither a compound nor a complicated nature, it may be reduced by proper bandaging; and this has sometimes been the case. When it is in the upper pastern, it is easily discovered, and is often the result of a violent effort made by the horse to prevent himself from actually falling when he has made a stumble. In treating for it, if it runs laterally across the bone, a bandage steeped in some adhesive matter is applied from the coronet to the middle of the leg. Over this some damp or wet pasteboard should be moulded, and afterwards enveloped in a linen bandage. A small splent should next be applied, before and behind, on each side, and the hollow places filled with tow, with the view of giving them an equal bearing. Should this not be sufficient to insure security, other splents, thicker and broader, should be placed over those, extending to the knee or the hock.

In reference to the coffin-bone, Mr. Percivall says—"Buried as the coffin-bone and navicular bones are within the hoof, and out of the way of all external injury, as well as of muscular force, fracture of them cannot proceed from ordinary causes." From whatever causes these fractures are produced, however, "Let your remedies," says Mr. Mayer, "be governed by those principles of science, those dictates of humanity, and that sound discretion which, while they raise the moral and intellectual superiority of man, distinguish the master of his profession from the bungling empiric."

CHAPTER XII.

DISLOCATIONS.—THE STIFLE-BONE; SESAMOID BONES.

THE STIFLE-BONE.

DISLOCATION of the stifle-bone frequently happens from kicks and slips out of the hind leg, so that the bone becomes thrown out of its socket. When this happens, the limb becomes totally helpless, and the horse draws it after him in the most distressing manner.

The treatment is to extend the limb forward, and fasten it in the same manner as described for fracture of the tibia. Having done this, place one hand against the bone, and press moderately from you with the other; then take hold of the point of the hock, and you will feel the stifle-bone snap into its place or socket. A re-occurrence of this accident can only be prevented by using counter-irritants all round the joint. For these take

Ol Terebinth	3 oz.
Ol Olivæ	3 do.

Apply three or four table-spoonfuls to the stifle, all round the joint, morning and night. This will create considerable swelling; and by so doing, keep the stifle-bone in its socket. Should this not be found sufficiently powerful to retain the bone in its place, take

Cantharides	1 oz.
Ol Terebinth	4 do.

Shake well together when used.

This will occasion a considerable swelling, but will have the desired effect.

THE SESAMOID BONES.

Sesamoids is the name given to those bones which are situated at the back part of the fetlock joint, and are attached, at the upper end or point, to the suspensory ligament, the flexor tendons passing in a concave groove between the two, in their passage to the pastern and coffin-bones. They take their name from their resemblance to maize, or what is perhaps better known as Indian wheat. They have a peculiar elastic movement. Every step the horse takes, and more especially in the fast trot or gallop, they partially descend, on his putting his foot to the ground. This is easiest seen in long-pasterned horses, where *the fetlock*—hair—almost seems to touch the ground. If the animal is over-weighted, this will be distinctly observed.

The *inelastic* connection which these bones have below, to the head of the large pastern bone, and the *decided elastic* connection they have above to the suspensory ligament, clearly show how easy they may be partially, if not altogether dislocated. This is more ready to happen on the inner side, in consequence of the superincumbent weight being thrown on that side when the other foot is in the air, or, to speak more plainly, off the ground.

The action of the sesamoids being backwards and downwards, the upper end of the elastic attachment expands; and this expansion, driven to excess, either by over-weight, heavy ground, or when the animal is at the top of his speed, brings the non-elastic attachment below into such violent action, that the bones become incapable of contending with it. The consequence of this is, that the ligamentous attachment is ruptured. This is not an unfrequent case; for in racing as well as in hunting, the horse sometimes makes a sudden drop, which, in many instances, is taken for what is termed "breaking down;" but it is no such thing. It is the rupture of a portion of the lower attachment of the sesamoid bones, principally on the inner side—when this side of the fetlock joint will appear much larger than the outer. If the hand is passed down the leg, over the part, pressing gradually as it is moved down, the seat of partial dislocation will at once be discovered, not only by the projection of the upper end of the bone, but by the pain which the horse will show himself to be suffering on pressing the most prominent part of the bone.

This accident has occurred, and the inflammation run so very high, that the whole of the leg, up to the knee, has been swollen to such an extent, that the disease has been taken for strain in the back sinews, when, in fact, it entirely arose from this partial dislocation of one of the sesamoid bones.

The curative treatment of this disease always involves a considerable space of time; although the time might be very much shortened if persons discovered the part affected at once. All liniments, or blisterings, will never permanently remove it, though they may relieve it; but when the horse is brought into use again, he becomes lame. On this account recourse must at once be had to firing; not in a partial manner, but it must be extended a little above the bifurcation of the suspensory ligament—say about an inch, and as far as half-way down the large pastern bone. Fire *all round* the leg completely; then lay lightly on it—

Cantharides	4 drachms.
Hog's Lard	2 oz.

Take the necessary precaution to prevent the animal either rubbing or biting the leg. Whilst he is in the stable, give him bran mashes cold, and

Cape Aloes	4 drachms.
Ginger	1 do.

Mix, to form a ball, with soap.

If he should be costive, which is sometimes the case, repeat the medicine before he has a run at grass, which he ought to have in about nine days after the firing. The accompanying explanatory engraving, showing a section of the foot, its bones and ligaments, with the appearance of the hoof in a healthy and diseased state, will greatly assist the reader in obtaining a knowledge of the anatomy of that important member of the horse.

CHAPTER XIII.

GREASE; MANGE; SURFEIT; MALLENDERS; SALLENDERS; WARTS; HIDE-BOUND; FARCY.

GREASE.

Formerly this disease was a pest to the stables of almost every horse-master in the kingdom; and though simple in itself, the real cause of it lay in obscurity for many years. It is not only disagreeable, but painful in the greatest degree, and not unfrequently lays the foundation of other diseases, such as cracked heels, canker, and their kindred affections. Nothing was more common than to see it in the stage and hackney-coach horses, the farmer's horse, and, indeed, every kind of horse except the racer. Grease is an inflammation and suppuration of the vessels of the skin, generally in the hind legs; the circulation being weaker there, on account of their being situated at a greater distance from the heart, when, from a want of uniformity of action with the other parts in the circulation, a congestion takes place.

The cause of this disease is the quickening of the circulation by the horse being brought into a hot stable, most likely with his hind legs wet, the evaporation of which produces cold, to be followed by congestion, as the warm stable increases the action of the heart.

It does not affect all horses alike, nor all parts alike, certain descriptions of animals being more susceptible to the disease than others. Thorough-bred horses, such as the racer, are the least subject to it, principally from the fineness of their skin, and the care which is taken of them—proper attention being paid to the temperature of their stables. If a thorough-bred horse were exposed to cold for years, his skin would become thicker and thicker; and such horses would degenerate.

There are many circumstances which predispose to grease. The first is, thick skin and white hair, which is a proof of a weak circulation. Another circumstance is the colour and make of the animal—light chestnut, with white legs, narrow chests, and long legs. "Everything," says the editor of *The Horse*, "that has a tendency to excite inflammation in the skin of the heel, is a cause of grease. Therefore, want of exercise is a frequent source of this disease. The fluid which accumulates about the extremities, and is unable to return, is a source of irritation by its continued pressure. When high feeding is added to irregular or deficient exercise, the disease is still more likely to be produced. Want of cleanliness in the stable is a frequent source of grease. When the heels are imbedded in filth, they are weakened by the constant moisture surrounding them—irritated by the acrimony of the dung and the urine, and little prepared to endure the cold evaporation to which they are exposed when the horse is taken out of the stable. The absurd practice of washing the feet and legs of horses when they come from their work, and either carelessly sponging them down afterwards, or leaving them to dry as they may, is however, the most common origin of grease."

This disease often breaks out in October, when the legs of the animal begin to feel the change of season, and are wet and cold. After being brought into stable, the heat causes evaporation to take place; and in proportion as horses become cold, so are they susceptible of heat, if not governed by specific limits.

Grease may be either local or constitutional. In its local form it is generally severe in proportion to the relative temperature the parts have been exposed to. Heat after cold is then an exciting cause, and according to the previous cold, it acts; the cold being in part governed by moisture, and the length of time occupied in evaporating: if, therefore, the legs of an animal with much hair, hold most water, and produce much cold, so will they be proportionably liable to grease.

From these facts, it is natural to conclude, with Mr. Youatt, that the practice of washing the legs, without they are afterwards wiped dry, is bad; for, by rubbing them quite dry, there is done to the vessels of the heels a similar act to that which the heart is doing to

the arteries; namely, increasing the circulation, and preventing congestion and inflammation. If the dirt cannot be perfectly rubbed off, it is better to leave a little of that than have a great deal of grease.

In order, then, to avoid grease, when horses are brought into the stable, let them have as much air as possible, by opening the windows, so as to make the increase of circulation gradual.

Many opinions have been advanced, to show that grease is only local; but other cases show it to be thoroughly constitutional. This is proved by the fact of many horses having it during a number of years, though the greatest pains may have been taken with them to prevent it. "There is no rule without exception;" and impurities may be lurking in the system. If this is the case, nature takes these means to get rid of them, and wisely selects those parts as remote as possible from the vital principle of action; for, it is well known, from the kind of horse, and the care constantly taken of him, if it appears at all, it must arise from diseased blood, or an hereditary taint from sire to dam.

In the treatment of grease, the first thing to be done is to bleed the horse according *to size and condition*, to the extent of from three to six quarts. After this, give him bran mashes only; regulate him as directed in the article on Conditioning Hunters: at night, give him one of the doses of physic, as recommended at the conclusion of the same article. Take a bucket of warm water, and some soft soap, and well wash out his heels; free them from all scurf and scabs, dirt, and any other offensive matter that may be lodged in them. This done, get for a poultice four ounces of linseed meal; pour sufficient hot water to make it of a proper consistency; then, just as about to apply the poultice, have ready a pot of digestive ointment, composed of the following:—

Common Turpentine	4 oz.
Hog's Lard	12 do.

Melt together over a slow fire.

Mix about two ounces of this with the poultice, and fasten it round the horse's legs by means of an old stocking, which should first be drawn on the leg, tied round the hoof, and then turned down to receive the poultice in the hollow of the heel. Poultices do no good except they are always kept moist. Therefore, at night repeat the washing with the soft soap, &c., and also the poultice. Do this until the heels are thoroughly clean and appear healthy; then commence healing them with the following:—

Common Turpentine	2 oz.
Hog's Lard	2 do.
Alum, finely powdered	3 do.

Melt the turpentine and lard together; then sprinkle in the alum, and stir till cold. Should this not be found sufficiently strong, add

Sulphate of Zinc	1 oz.

These remedies are generally found sufficient to heel the cracks and sores of the heels; but care must be taken not to stop the discharge too suddenly, and especially if of a constitutional nature.

Some constitutions will not even admit of ointment being applied. If such be the case, prepare

Sulphate of Zinc	8 oz.
Boiling Water	2 pints.

Apply this lotion frequently to the heels.

If a mild lotion be required, first use alum instead of the zinc, varying the dressing as it may be requisite.

At the end of five or six days, give another dose of physic, as directed before. The horse should have exercise, if the weather is dry; but on no account should his legs be suffered to get wet. A bandage round them will be found highly beneficial; and, by all means, put him in a loose box, or bay of a barn, that he may exercise himself at liberty. When the process of physicking is concluded, give diuretic balls, composed of the following ingredients:—

Resin, powdered	8 oz.
Nitre, do.	4 do.
Juniper Berries	4 do.

Soft soap, to form the mass, and divide into twelve.

Give one of these balls every second day. By this treatment grease will be got rid of; but constantly bear in mind, to prevent it there is nothing to equal cleanliness.

MANGE.

This distemper is so universally known, that a general description of its most predominant features is unnecessary. Let it suffice that a mere superficial view of it

instantly conveys to the spectator a very strong idea of wretchedness and poverty. Nothing, indeed, can convey this stronger than seeing nature exhausted, and sinking under a complication of disease, debility, and poverty.

This disease, however, is very little seen amongst horses of any estimation; on the contrary, it is almost entirely confined to the lowest stables, and the lowest proprietors. It is observed to fall chiefly upon those that are ill-fed, or scarcely know what corn is, at least, by the taste, but are kept entirely on the refuse of provender, barren pastures, musty hay, separated hay-bands, swampy mossy ground—so poor, that it yields the smallest portion of nourishment. From such feeding, nature may support a wretched existence, but cannot be furnished with such sustenance as is necessary to the maintenance of the frame of the horse in a healthy state. From this mode of living—rather starving—originates the severe and inveterate disease known as the mange; and where it has been allowed to commit its ravages to a considerable extent, it is in the last degree painful to contemplate the poor animal that is suffering from it. It is a pimpled vesicular corruption, and is in the highest degree contagious. "Among the truly healthy, so far as my experience goes," says Mr. Blaine, "it never arises spontaneously; but it does readily from a spontaneous origin among the unhealthy."

It is by low feeding that the mange is often generated, when the blood becomes thin and weak, and loses a considerable portion of its vital principle. Thus extravasated and unrestrained, its morbid effects and virulence soon display themselves upon the surface, with a severe and constant irritation and itching, principally about the neck, and under the hair of the mane; though all parts of the animal are subject to it, occasioning him to be constantly rubbing himself, till with this and the loss of hair from different parts, he bears the universal appearance of approaching excoriation. Many persons of the old school are in the habit of applying powerful caustic applications, which may have the desired effect ultimately; but the pain the poor dejected brute undergoes beneath such treatment, suggests to humanity that immediate death would be much more merciful.

The mange itself is found in the existence of a parasite burrowing in the skin, known as the *Acarus scabiei equo*, which bears a strict analogy to the parasite which produces the same disease in the dog, and the itch in man. It belongs to the family of mites, and is found in all kinds of preserved animal and vegetable substances. It has eight legs, and has an uncommon power of tenacity in adhering to the skin.

In treating for the mange, commence to feed, night and morning, with half *bran* and half *malt*, or with equal parts of *oats* and *bran*. It is preferable to have the *malt* made slightly wet, not sloppy. Sprinkle a handful of coarse *brown sugar* in it; then mix all together, and give morning and night. For the middle-day feed, give a quartern of sweet oats, with a handful or two of chaff. During this treatment, which must be continued for at least a week, when it will begin to soften his skin, give the best and sweetest hay that can be procured.

At the expiration of a week, when the frame becomes more invigorated, discontinue the mashes, and let the diet be changed to good oats, with a handful of bran night and morning, first sprinkled with water, that one of the following powders may just adhere to it:—

Sulphur	1 lb.
Prepared Antimony	1 do.

Rub these well together in a mortar, and divide into twenty-four equal parts. For the middle-day feed, continue the oats and chaff, dry. External applications may now be begun. For these, procure a pail of warm water, and a quarter or half a pound of soft soap, or more if required, and tie a portion of it in a linen or woollen rag. Let every infected part be thoroughly washed, and well cleansed with this, by forming a substantial lather, till no scurf or filth remains on the surface. Then rub tenderly with a linen towel until dry, and, on the following morning, begin to rub in a necessary portion of the following ointment upon every part affected, as the urgency of symptoms may require; and repeat daily until satisfied of the cure:—

Mercurial Ointment (weak)	8 oz.
White Hellebore, powdered . . .	3 do.
Olive oil, sufficient to make it soft.	

Or, use the following, which may be a more convenient application :—

White Hellebore, powdered . . . . 1 oz.

Boil this in three pints of water until reduced to one quart; then add—

Muriate of Quicksilver . . . 2 drachms,

after having been dissolved in

Muriatic Acid . . . . . 3 drachms.

This lotion is to be applied to all the affected parts with a small piece of sponge, having first poured a portion of it into a saucer. This is a very efficacious remedy, and the disease has been perfectly cured by it in three dressings. It should not be applied, however, until the horse is sufficiently strong to bear the application.

Continue the use of the powders before mentioned, with, occasionally, nitre in his water —an ounce is sufficient at one time—for three weeks or a month; and so soon as it is conceived, by his condition, that he is in a state to bear it, take away a moderate portion of blood —say between two or three quarts; give him afterwards two mild doses of physic, selected from the prescriptions on that article. This will be found greatly to renovate him.

The horse, from his previously impoverished condition, will be much restored by the following tonic medicine:—

Sulphate of Iron	12 drachms.
Gentian, powdered	12 do.
Ginger, ditto	6 do.

Form into a mass with honey, divide into six balls, and give one every day. By this means his constitution will be strengthened; and that poverty-stricken look with which he had before been stricken, will gradually disappear.

With regard to the horse's trappings or appointments, such as the saddle, bridle, clothing, or harness, either gig or cart, they should be well washed and cleansed with soft soap and hot water. The stable should be well limed and whitewashed, so that every particle of the disease may be totally eradicated. This and good keep will prevent a recurrence of the affliction. In the treatment of the mange, Mr. Youatt doubts the propriety of bleeding in some conditions of the patient. "If mange is the result of poverty, and the animal is much debilitated, bleeding will increase the evil, and will probably deprive the constitution of the power of rallying. Physic, however, is indispensable in every case. It is the first step in the progress towards a cure. A mercurial ball will be preferable to a common aloetic one, as more certain and effectual in its operation, and the mercury probably having some influence in mitigating the disease. In this, however, mange, in the horse, resembles itch in the human being. Medicine alone will never effect a cure. There must be some local application. There is this additional similarity—that which is most effectual in curing the itch in the human being, must form the basis of every local application for the cure of the mange in the horse. Sulphur is indispensable for every unguent for mange. It is the sheet-anchor of the veterinary surgeon. In an early and not very acute state of mange, equal portions of sulphur, turpentine, and train oil, gently but well rubbed on the part, will be applied with advantage. Farriers are fond of the black sulphur; but that which consists of earthy matter, with the mere dregs of various substances, cannot be so effectual as the pure sublimed sulphur. A tolerably stout brush, or even a curry-comb lightly applied, should be used, in order to remove the dandriff or scurf wherever there is any appearance of mange. After that, the horse should be washed with strong soap and water as far as the disease has extended; and when he has been thoroughly dried, the ointment should be well rubbed in with the naked hand, or with a piece of flannel. More good will be done by a little of the ointment being well rubbed in, than by a great deal being merely smeared over the part. The rubbing should be daily repeated."

SURFEIT.

Of surfeits there are two kinds, originating in different causes; one being no more than an advanced stage of hide-bound, or out of condition, which, having been long neglected, continues to increase, with all its concomitant symptoms, till the blood becomes affected, and Nature sets up this process to relieve herself through the skin.

The other kind of surfeit may be attributed to drinking cold water. This differs from the other in cause, but very little in effect; and is that kind where, from ignorance or inattention,

a horse is suffered to drink immoderately of cold water when in a violent perspiration, and the blood, consequently, in the highest degree of circulation.

The shock nature sustains by this revulsion may be easily imagined. The blood, when in its greatest velocity, is instantaneously checked by the sudden application of cold to the stomach. The stomach and skin having an intimate sympathy, the pores of the latter become, as it were, instantly plugged up, when serous parts of the blood, which extravasates itself, and, by an effort of nature, is propelled to the skin for transpiration, is obstructed, and has its passage to the surface absolutely prevented, and rendered impracticable. Thus fixed, it becomes united with the perspirable matter already confined there—forming a *morbid* combination—and is, in the course of time, compelled, by the progress of internal inflammation, to make its way through the skin, upon which it, at last, appears in a variety of forms, assuming distinct degrees of malignancy, according to the state, habit, and constitution of the subject at the time of attack.

In treating for this disease, first remove cutaneous obstruction, correct the acrimonious state of the blood, and gently quicken the circulation. The better to gain this object will be to take away a moderate portion of blood, about three quarts, that the impetus may be encouraged; open the body with warm bran mashes; and according to the mildness or inveteracy of its appearance, give—as the case may require—either two or three of the following purging balls, allowing sufficient time between each dose, and exerting more than usual precaution on account of avoiding cold; for although this quantity of mercury will be remarkably gentle in operating, and may be administered with the greatest safety and effect; still great care is required in all cases where this mineral is given, whether to man or beast.

Barbadoes Aloes	6 drachms.
Calomel	1 do.
Ginger	1 do.

Soft soap, sufficient to form the ball.

After the course of physic has been regularly gone through, let strict attention be paid to the directions set down relative to food, dressing, and water. In three days after the last dose of physic, begin with the following course of alterative powders :—

Antimony, powdered	1 lb.
Sulphur	1 do.
Cream of Tartar	4 oz.

These are to be well mixed together, and divided into twelve equal parts, giving one every night with a feed of corn ; which, being first sprinkled with water, the powders will adhere to it, and ensure their consumption. A handful of chaff is excellent to make the powders adhere. Whilst giving the alteratives, occasionally give an ounce of nitre in the morning water.

Should any trifling eschars, scabs, or excoriations prove obstinate upon any part of the body, they may be washed with a solution of zinc.

Zinc	1 oz.
Boiling Water	6 „

Dissolve the zinc in the boiling water, and apply to the sores, with a small piece of sponge. This must be continued until the sores are healed.

MALLENDERS.

These are cracks, situated directly on the back part of the knee-joint; occasioned, in general, more by neglect in grooming, than by any casual or constitutional defect in the subject. The matter they discharge is, in some cases, thin, and of an acrimonious nature. In others, it forms a kind of glutinous discharge, and makes an appearance of small scabs, or scurfy eschars upon the surface, constituting a want of flexibility, and frequently causing considerable lameness. The first thing to be done is, to have the parts well washed with soft soap and warm water; repeating the washing night and morning, till the eschars relax from their rigidity, and separate of themselves. This will be considerably promoted by rubbing in lightly, after each washing, a small quantity of hog's lard, which will loosen the scabs, and cause them to fall off much easier when washed.

As soon as the cracks are perfectly free from scabs or scurf, apply the following ointment :—

Strong Mercurial Ointment . .	1 oz.
Hog's Lard	1 „
Gunpowder, finely powdered .	4 drachms.

Let these be well worked together, and applied morning and night. This will stimulate the parts, and make them quickly heal. The washing, morning and night, must be continued about an hour previous to applying the ointment; which will give the parts time to dry. Should a perceptible foulness in the subject justify the measure, take away a proper quantity of blood, according to the size of the animal; and, occasionally, put an ounce of nitre in his water, for a fortnight; or, give half a dozen of diuretic balls, as follows:—

Powdered resin	3 oz.
Linseed meal	1 „

Soft soap to form the mass.

Divide into six, and give one every morning the first thing. Should these remedies appear not to assist the cure, and the cracks not heal so fast as desired, then proceed to stronger means.

Cape aloes	8 drachms.
Calomel	2 „

Form into a mass, with linseed meal and soft soap, and divide into two balls. Give at intervals of about five days, according to the strength of the horse.

SALLENDERS

Are situated upon the fore part of the hock, and are to the hind legs what mallenders are to the fore legs. They originate in the same cause, and are cured by the same means.

WARTS

Are troublesome things on account of the itching sensation with which they are attended. They are, also, extremely offensive to the eye of the owner, especially if they bleed much, besides making it highly disagreeable to ride a horse in such a state. The only means to remove them is, either by ligature, or the knife. In many cases it is necessary to have the horse cast. Some warts are situated in such places, that one has not an opportunity of properly getting at them, without incurring considerable danger. If it be the intention to remove them by ligature, take of

Arsenic	1 drachm.
Hog's lard	1 „

Mix, and apply to that part of the ligature embracing the wart, once a day; or apply, in the same manner, butter of antimony, anointing the part with the feather-end of a pen. The most effectual manner, however, is to remove them with the knife; and immediately, but slightly, canterise the part. This has been found to answer better than any other application.

HIDE-BOUND.

This disease has been attributed to many causes, and appears in a want of flexibility of the skin, which is pervaded by a general stiffness, that seems to form an entire adhesion to the flesh, without the least partial separation or distinction. There is plainly perceived underneath the hair, a kind of dusty scurf, that raises it up in different parts, and gives it another hue, the coat, in many places, forming an appearance of two or three colours, and showing at once that the insensible perspiration, which should always be going on, is either retarded, or wholly stopped.

The horse exhibits a general languor, dullness, heaviness and weakness. His excrement is dark, foul, and very offensive. He sweats much upon every moderate exertion, and his coat stares, the hair turning different ways, the effluvium of which is highly disagreeable, and affords evident proof of weakness and debility.

The probable cause of all this is most apparent in bad food, and want of that proper care which the animal requires in the stable. These are the principal causes of this disease; still there are others, all centring in poverty; such as allowing him to feed on the long, lank grass, which is found in low swampy lands in the autumn, and musty hay, or bad oats, which may in some degree allay hunger, but not gratify the appetite; for being in itself destitute of the quality of superior food, it does not sufficiently contribute to the generating of blood, or stimulating the system.

The sources for the supply of chyle being thus obstructed, the lymphatics are deprived of their due proportion of nourishing fluid, and become, not only in some measure contracted, but in a great degree inactive. This, with the want of external care and dressing, contribute to an almost universal obstruction of the cutaneous pores.

Although we have called *hide-bound* a disease, yet, under judicious management, it is scarcely

entitled to that designation, being in fact no more than a temporary inconvenience. To cure it, therefore, take away about two quarts of blood, and in three or four hours after, give a mash of malt, oats and bran, equal parts, continuing the same every night for a fortnight, stirring in it one of the following powders:

Flour of brimstone	12 oz.
Antimony	1 lb.

Let these be well rubbed together, and divided into twelve parts. Give other feeds, morning and noon, of equal parts of oats and bran moistened with water. If the continuance of the bran should relax his body more than seems judicious, put into his feed a handful of split beans, and the same quantity of chaff. This method of treatment will be found to succeed; but it should be accompanied with regular and substantial dressing, air, exercise, sound good oats, the best sweet hay, and fresh soft water. When by this means, he begins visibly to improve in his hide, coat, and condition, let him have, twice in the week, a brushing gallop, to produce a tolerable sweat, and enliven the circulation, taking great care to let him stand still until he is perfectly cool. Then dress him thoroughly, and persevere in this every night and morning until he is well. Should this method be unattended with success, there must be lurking in the system something else that should be removed. Take, therefore,

Blue pill	2 drachms.
Aloes, Cape	4 „

Give this in the evening, and keep all food from him during the night. In the morning treat as in administering a dose of physic. In the course of four or five days, repeat the medicine, and, if a third dose should be required, which will be ascertained from his appearance, let him have it, taking care that he does not get chilled during the action of the mercury. The following powder has been recommended to be given daily in his food without having recourse to the preceding preparations:—

Cantharides, finely powdered	5 grains.
Pimento	5 drachms.
Sulphate of Iron	2 do.

Should the animal reject his food with this in it, form it into a ball, with treacle, and give it for a week or a fortnight as the occasion may require. In the early part of summer, a good piece of grass will be found of great service.

FARCY.

This is one of those diseases, to cure which, and its co-disease, *glanders*, the veterinary profession have been more puzzled than with all the other diseases to which the horse is liable. For a long period the cause of this complaint was hidden in obscurity. All old writers said it was something the matter with the blood, but could not tell what. The French studied the disease, and its nature, but still little progress was made towards elucidating its cause. We are now, however in a position to be able to define the disease in a much more enlightened form, although its cure cannot at all times be effected.

Farcy may be defined to be an inflammation and suppuration, attendant with ulceration of the absorbents of the skin. It was formerly thought to be a disease of the veins, but this is not the case. Its seat or locality is in the superficial absorbents of the skin covering the veins. Were it otherwise, the veins would ulcerate and open, and considerable bleeding take place. Externally, the skin may be said to be the only visible part susceptible of farcy; but when the disease becomes violent the lungs partake also of it. Every part of the skin is susceptible of the disease, but not all parts equally so. Wherever the skin is thinest, there it is much more liable to become affected than where it is thick.

The commencement of the disease is generally accompanied with swelling and inflammation, and, at length, a single tumour appears. This goes on until matter is formed, suppuration takes place, and of course ulceration. The tumours do no always suppurate, but often become hard and schirrous. These, in the old farriers' language, are called "*buds*, or farcy buds;" there are frequently many of them, forming a kind of chain enlarging to an alarming degree. Such are the common symptoms and appearance of the disease. It takes place most frequently in the hind legs.

There is a poison connected with this disease, which, if applied to the skin of a sound horse, will produce inflammation and matter of the same kind; and if the matter becomes absorbed, it will, in all probability, produce

glanders. But in all cases this might not occur, as there are some constitutions much more susceptible of disease than others.

However, this experiment proves the matter to be contagious, because it is possible to produce it on a healthy animal. There is another curious fact connected with this poisonous matter. If it is inserted deep below the skin, it does not produce *farcy;* but is absorbed into the system, and may produce *glanders.* In this case the absorbents do not inflame, which would prove farcy to be a skin disease, in which the deep-seated absorbents become affected, and the superficial ones not so. From this cause, if a horse with farcy were to be flayed at this stage of the disease, there would not be the least appearance of it under the skin; nor can it be produced in a sound horse without an abraded surface. It may be produced, however, if applied to the membrane of the nose of the animal in such a manner as not to abrade the surface. Professor Coleman's opinion is, that one horse in a stable cannot communicate it to another, without an abraded surface. This would seem to prove that it is generated, and that constitutional diseases cannot be produced except by contact. If poisoned atmosphere be inhaled, disease may be propagated by breathing it, whilst contagion requires the actual contact of the diseased animal; though there is little or no distinction, for the poison does not come in contact with the lungs under infection. Such diseases are mostly the effect of crowded and filthy stables, and such as are contagious may be produced without contact. With regard to farcy, it has been questioned whether one in one thousand ever becomes affected by the actual touch of this matter, showing clearly that it is not a local disease. Formerly it was thought by some to be caused by drinking cold water, and eating beans; but it is more likely to be produced by a poisoned atmosphere—an atmosphere over and over again impregnated with what escapes from the lungs, the skin, the dung, and the urine. During the French war, when an expedition was despatched to Quiberon, the horses which were shipped on board the transports had to be closed in under the hatchways, so that the poor animals were well-nigh suffocated with heat. The consequence of this was, that when they were disembarked, nearly every one of them was either farcied or glandered.

Pure air is so important to life, in every condition, that even the strongest animal, if deprived of it, soon exhibits symptoms of distress. Farcy, therefore, is a consequence of an impure atmosphere, and is intimately connected with glanders. "They will run into each other," says Mr. Youatt; "or their symptoms will mingle together; and before either arrives at its fatal termination, the other will generally appear. An animal inoculated with the matter of farcy will often be afflicted with glanders, while the matter of glanders will frequently produce farcy. They are different types of the same disease. There is, however, a very material difference in their symptoms and progress; and this most important one of all—that while glanders is incurable, farcy, in its early stage and mild form, may be successfully treated."

The same writer further adds, that farcy, like glanders, springs from contagion and bad stable management. "It is produced by all the causes which give rise to glanders, with this difference—that it is more frequently generated, and sometimes strangely prevalent, in particular districts. It will attack, at the same time, several horses in the same ill-conducted stable, and others in the neighbourhood who have been exposed to the same predisposing causes. Some have denied that it is a contagious disease. They must have had little experience. It is true that the matter of farcy must come in contact with a wound or sore, in order to communicate the disease; but accustomed, as horses are, to nibble and play with each other, and sore as the corners of the mouth are frequently rendered by the bit, it is easy to imagine that this may be easily effected; and experience tells us that a horse having farcy ulcers, cannot be suffered to remain with others without extreme risk."

Horses most predisposed to farcy, are those that are narrow-chested, with flat sides and long legs. Common farriers say they can cure the disease, because they think it is a merely local affection, and consequently easily treated. In this belief, they burn the ulcers, and may, in some instances, perform a partial cure, if the poison has not thoroughly pervaded the system. But in most cases, when thus locally treated, it breaks out again even at the end

of twelve months, and sometimes terminates in glanders. When the lungs are not touched, a cure is sometimes effected by such treatment. If the disease is purely local, as when the buds are on the legs only, indicating that it is confined to the lymphatics of the skin, the disease may be reduced; but if the poison has got into the system, a perfect cure may, in general, be despaired of. The probability, however, of expelling the disease will depend upon the circumstance of its being local or constitutional; and, if the latter, to what extent the system has been affected by it. Should the membrane of the nose have become at all ulcerated, or the membranes lining the bones of the head, have begun to secrete and discharge a disagreeable matter, the chances are a hundred to one of succeeding in a cure.

If the horse should be in tolerable condition he should be immediately bled, according to strength, size, and constitution; and the following ball given to him:—

Cape Aloes	8 drachms.
Ginger	1 do.

Form with soft soap.

Treat as directed in administering doses of physic. Should the farcy buds diminish, or no increase take place in those which are formed, give a second dose of medicine, and treat as before. The next thing to be done is to lay the farcy buds open. These will be found principally on the inside of the hind leg, frequently down the neck, in the line of the jugular vein, along the back, and frequently on the face. When found in this last, the cure is always doubtful. Some persons open the buds with a lancet, and apply the actual cautery, to destroy at once by fire what is imagined cannot be done any other way: but objection has been taken to this mode of treatment. It is better first to open all the abscesses with a lancet, after squeezing out the matter, which must be exceedingly carefully done, for the pain the horse experiences when undergoing this operation makes him very fidgetty; and it is sometimes attended with great danger. After all the matter is cleared away from the sores, a little sulphate of zinc should be applied to each of the opened buds. This application will be found highly beneficial on first opening the buds. If this has been done in the morning, let it be again repeated at night; then on the morrow, wash the sores well with the following lotion.

Extract of Saturn	2 ozs.
Spirits of Wine, camphorated	8 do.
White Wine Vinegar	1 pint.

Mix well together, and keep it close stopped for use; then take of—

Prepared Antimony	1 lb.
Sulphur	12 ozs.
Cream of Tartar	8 do.

Incorporate well in a mortar, and divide into twenty equal parts, giving one part every night in his corn, first sprinkling with water to insure the adhesion of the powders. This proportion is meant for the distemper in its mildest state, when the buds have made their first appearance.

Should the distemper be in a more advanced stage, bleeding should be repeated, in a proper time and in a moderate degree; and upon the scabs or eschars peeling from the buds, they should be occasionally washed well with the following:—

Corrosive Sublimate	2 drachms
British Brandy	½ pint.
White Wine Vinegar	1 do.
Tinct. Myrrh and Aloes	2 ozs.
Water	½ pint.

First dissolve the sublimate in the brandy, then add the other articles, and shake well together: or, take

Sugar of Lead	1 oz.
Sulphate of Zinc	1 do.
White Wine Vinegar	1 pint.
Water	½ do.

Mix together.

For internal medicines, an immense number have been tried, and some with excellent effect; but the variety being great, the right one is not at all times chosen. The following formula, however, has been found excellent.

Cantharides	5 grains.
Arsenic	4 do.
Sulphate of Iron	1 drachm.
Gentian	1 do.
Ginger	1 do.

Form into a ball with soft soap.

Give one every morning, first thing. Or,

Corrosive Sublimate	4 grains.
Sulphate of Iron	2 drachms.

Form into a convenient-sized ball, with linseed meal and soft soap.

Give every morning. Or,

Blue Pill	2 drachms.
Aloes	1 do.
Ginger.	1 do.

Mix together for one ball, with a little oil of turpentine, and give one every second morning. Great care must be taken to watch the horse that he does not become salivated. If either of the foregoing prescriptions should appear to take his appetite away, let him remain for a day or two, without giving him any of them. Whilst administering these medicines, the horse should be well kept, and fed without stint. An ounce of nitre may occasionally be dissolved in his morning water, as he will then be most likely to drink. A little green meat will be good for him; and when he is getting better, give him a run at grass in some place handy, and a feed of corn morning and evening. Speared malt is excellent at this time; also, about a teacupful of linseed poured into a quart of boiling water; mixing with it, eight or nine good potatoes, well boiled and worked up together. This may be given with his corn at his mid-day feed. He may, at first, refuse to take it; but this dislike will, by a little perseverance, soon be overcome, when the benefit that will arise from it will be, at once, apparent. Carrots are very good, chopped up fine; also turnips of the Swedish kind, as they contain more saccharine matter than any other; also parsnips; but of these, a few only should be given at a time; for, if given in quantities, they are apt to cause gripes. The treatment, as practised at the Royal Veterinary College, is by administering from two to five drachms of sulphate of copper, in solution, in about a pint of water; increasing or decreasing the dose, as circumstances may require; and also applying to the sores daily a solution of the same sulphate, in the quantity of two ounces to a pint of water. In the recent edition of *White's Compendium of the Veterinary Art*, edited by Mr. Spooner, that gentleman says, that the treatment of farcy "must be very similar in its nature to that recommended for glanders, but with a much greater probability of success. The system must be supported by a generous, though not too stimulating, diet, and the vegetable and mineral tonics administered as in glanders; but, if the sulphate of copper be employed, two or three drachms will be a sufficiently strong dose. Carrots or green food will be a useful addition to the diet. The buds should be opened with a lancet, and, when the matter is evacuated, a caustic should be applied to the ulcers. The lunar caustic will form a useful application; but other caustics may be employed. An ointment composed of two drachms of hydriodate of potash; lard, or palm-oil, two ounces; mercurial ointment, two ounces, should be rubbed daily in the course of the enlarged lymphatics. The horse should be exercised daily, and properly groomed; and the above treatment continued until all symptoms of farcy entirely disappear." In the *Materia Medica* there is a better form of this ointment, in which the mercury and the iodine are chemically combined.

The same gentleman observes that the most favourable symptoms presented by this disease are often delusive; for even when it appears to have succumbed to the skill of the practitioner, it breaks out again and again, and sometimes, when the morbid poison has thoroughly penetrated the system, after many months, it will make its appearance in the form of fatal farcy or glanders.

Mr. Blaine tells us of a horse so dreadfully afflicted with farcy that it was unable to stand, when it was drawn into a field of tares, and left there to take his chance. When the poor brute had devoured all that was within his reach, hunger forced him to search for more; and managing to crawl along, and eat as he went, he eventually recovered.

The dinioclide of copper has been introduced by Professor Morton, and beneficially used in farcy, as well as in such other diseases, as have a resemblance to glanders. It is usually combined with the root of gentian, to which small quantities of cantharides may be added with advantage. When an increased soreness of the diseased parts appear, its application should cease for a time, although this is an indication of the absorbent vessels being stimulated into increased action.

Water farcy is entirely different from the common farcy, of which we have here been treating, and is spoken of in another part of this work.

CHAPTER XIV.

SWELLINGS AND TUMOURS.—WINDGALLS; BOG-SPAVIN; THOROUGH-PIN; CAPPED HOCK; SEROUS ABSCESS; TUMOUR ON THE KNEE.

WINDGALLS.

WINDGALLS consist of a kind of cyst, or sac, attendant on most, or all joints, and frequently occasion lameness, and, if not this, they are a great eye-sore. These sacs are situate on both sides of the tendons, just above the fetlock joints, on the fore, and not unfrequently on the hind legs likewise. They become enlarged, generally, from hard work, causing a greater determination of blood to the part, and continue to increase until they become disagreeably large. It is from this circumstance, that liniments, or lotions, are applied to them to reduce them, and this apparently takes place; but when the animal is again put to work, they as certainly begin again to enlarge, and when they grow to the disagreeable size we sometimes see them, they never again contract, so far as to allow the affected part to assume its original form.

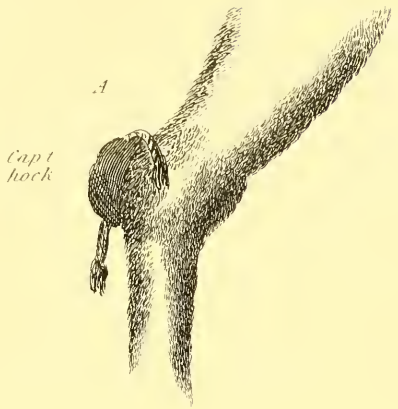
For the cure of these unsightly things, liniments, lotions, and even blistering have little or no effect. Perhaps the best plan to be adopted is first to clip the hair off all round the leg, over the fetlock joint, and about three inches above the seat of the enlargement. When this is done, the whole of the clipped part should be well rubbed with mercurial plaister, thoroughly melted. This should be effectively applied with a paint-brush, and none of the parts overlooked. This done, a flannel bandage, about three yards long, and about three inches broad, should be bound tight round the leg, and allowed to remain so situated for a fortnight; when by clipping it with a pair of scissors down the front of the leg, it may be allowed to fall off, and the limb be set at liberty. A cradle must be used. Should this mode of treatment not be found effectual, the parts may be fired, or the *bursæ* opened in the following manner:—Have the horse cast, and with a pretty large abscess-lancet lay open the enlarged *bursæ* at bottom, or lower part, to such an extent as to enable the finger to be introduced, which should be done and turned in it several times. This will break the membrane of the sac. Then put a suture in the wound, and draw the lips of it together, and allow the animal to rise. This treatment will, at first, cause some little swelling, which should be bathed well with warm water, two or three times a day, and a bandage applied. When the inflammation has considerably subsided, treat the puncture as a common wound. If the case is a bad one, and the windgalls very large, so soon as the inflammation has subsided, cast the horse again, and fire the parts, which has been found to act very successfully. The horse should have a loose box, and a dose or two of physic, during the time he is resting. In the treatment of these enlargements iodine and mercurial ointments have been advantageously used in proportion of three parts of the former to two of the latter. Blistering causes their disappearance for a time; but, with work, they are sure to return.

BOG-SPAVIN

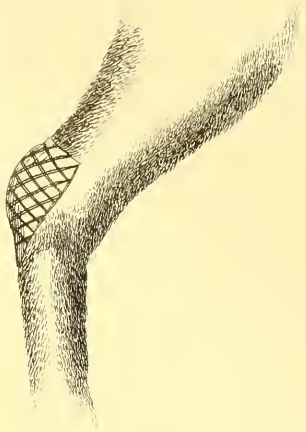
Is a disease, very common where there is hard work, especially in young horses, when they have been too early used. The hock is liable to more diseases than any other joint belonging to the horse; it being designed for very extensive motion; but the motion of it, during natural labour, is very different from that which occurs when an animal is thrown upon his haunches, or pulled up suddenly, or when taking high and wide leaps. These violent motions of the joint, are, as may well be supposed, likely to produce disorder. Bog-spavin, then, is an enlargement of the mucus capsule, situated immediately in the bend of the hock, and near to the superficial vein, passing obliquely over the part; in fact, it may be said to be a corresponding disease to windgalls in the fetlock joint. It does not always produce lameness; but, when so large as to do this, and prevent the horse from working, the tumour should be immediately opened as

CAPPED HOCK.

The Horses hock in its natural or healthy state.



When affected with the disease called Capt hock. A. when operated on with seton.

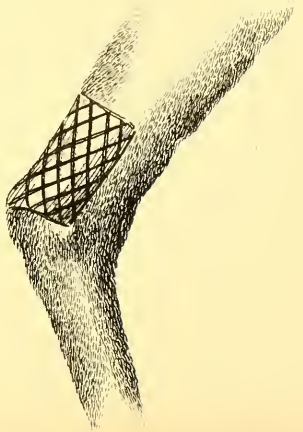


The method of Fireing for Capt hock after first being laid open

THOROUGH PIN.

The Horses hock in its natural or healthy state

When affected with the disease called Thorough pin.



Method of fireing for Thorough pin after first being punctured.

directed in windgalls. Great care, however, must be taken not to puncture the vein, which may be easily prevented, by tying a fillet of tape round the bottom part of the thigh. This will enable the course of the vein to be discovered, and, consequently, avoided. Having made the puncture, and found out the mucus, put into the wound a little sulphate of zinc, and proceed in all other respects as described for windgalls.

The editor of *The Horse* says, that the old and absurd method of passing a ligature above and below the enlarged portion of the vein, and then dissecting it out, is not in the advanced stage of veterinary science practised by any surgeon who regards his reputation; it being merely the consequence, not the cause of the disease. The only method of relief which holds out any promise even of temporary success is exciting considerable inflammation on the skin and thus rousing the deeper seated absorbents to carry away the fluid effused in the enlarged bag. For this purpose, blisters or firing may be tried; but in the majority of cases the disease will bid defiance to all appliances or will return and baffle our hopes when we had seemed to be accomplishing our object.

Where there is bog-spavin the horse should only be used for ordinary work. Hard or rapid work is out of the question.

THOROUGH-PIN

Is a bursal enlargement, situated in the upper and back part of the hock, the tumour showing itself on either side; hence its name, thorough-pin. This seldom occasions lameness. It is caused by over-weighting, immoderate riding, and ill-management in the breaking of young horses.

For its treatment proceed precisely as directed for *windgalls and bog-spavin*.

"I have," says Professor Spooner, "known a troublesome and obstinate lameness produced from the upper thorough-pin, or perhaps rather from some strain of the tendon which attended it. It gave way, however, at length, to a seton placed over the part—not through it. I have also succeeded in removing a very large thorough-pin in the lower situation in a high-class race-horse, by the long-continued application of equal parts of iodine and mercurial ointment; previously, however, stimulating the part with a mild liquid blister. The subject was a race-horse of great value, and the thorough-pin entirely disappeared in about two weeks. In such cases the synovial fluid in the thorough-pin coagulates, and becomes organised and firm."

CAPPED HOCK

Is a large swelling, rising at the point of the hock; and although seldom detrimental to the action of the horse is, however, very objectionable to the eye. It is produced chiefly by kicks, lying on hard stones, or other injuries to which the point of the hock is so very liable. It is sometimes hereditary. This may be taken as proved from the following fact. A veterinary surgeon was called in to see a horse, and was, at the same time, requested to look at a brood mare, and two of her colts, lying in a field close at hand, which were considered of excellent make and form. The dam was a known good one. She was a light chestnut mare, and the colts were of the same colour, one a three-year old, but the other a yearling; and all three, dam and colts, were affected with capped hocks. There had been a colt, which would then have been two years old, but it had been dead about six months, and he had capped hocks too. These were all got by different horses. This goes a great way in proving that like begets like.

If capped hock is not relieved soon in its early stage, it frequently becomes of considerable size, and what is strange, the skin seems to thicken as it becomes larger.

In treating for it in an early stage repellents such as the following should be used—

Sal-ammoniac	1 oz.
Spirits of Wine	1 do.
Vinegar	8 do.

Rub some of this lotion on the point of the hock, night and morning. Should this not promote the absorption of the fluid, introduce setons on each side of the hock, and keep the discharge up for a fortnight, dressing every day with digestive ointment, composed of

Common Turpentine	4 oz.
Hog's Lard	4 do

Melt together over a slow fire, and dress the setons with it, when these are changed every morning.

Should this not have the desired effect at

once, puncture with a lancet, and fire in the manner represented in the engraving, entitled Capped Hock. Whilst using the above remedies, give a mild dose or two of physic.

SEROUS ABSCESS.

This kind of tumour is produced by various causes, and is situated at the point of the elbow. It sometimes grows to an amazing size, even to that of a child's head. Serous abscesses are not always alike in their contents, some of them containing a yellowish fluid, and that in a considerable degree. This may be discovered by the undulating feeling they have when pressed between the thumb and finger. Others are hard, will not yield to pressure, and sometimes approach to callosity. Both kinds are generally produced in heavy dray-horses by their lying down on rough paved stables, and frequently when they double their fore feet up under them. The large calkins of the shoes then just come in contact with the point of the elbow, and a bruise will produce them. They may sometimes be caused by kicks, but this is not usually the case. If it were so the horse would instantly go lame, whereas by bruising gradually, the disease continues growing, and may produce lameness.

In treating for these tumours, supposing they contain the serous fluid, take up the skin in the most dependent part, and make an orifice with the seton scissors to let out the fluid. Then insert the finger, as if preparing to place in a tent, which should be done with tow, smeared over with the following digestive ointment:

No. 1.

Sulphate of Copper, finely powdered .	1 drachm.
Common Turpentine	2 ozs.
Hog's Lard	4 do.

Melt the turpentine and the lard together, and when nearly cold, sprinkle in the sulphate of copper. Or,

No. 2.

Red precipitate	4 drachms.
Common Digestive Ointment .	4 ozs.

What is here meant by the common digestive ointment, is the turpentine and hog's lard alone.

This will promote a healthy discharge, if the first recipe does not. Keep this open for a week or nine days. If the parts should swell much, foment them three or four times a day, with flannels dipped in hot water, until the swelling abates. Professor Spooner treats this tumour in the following manner. "If the collection of fluid be not extensive, we may first endeavour to disperse it by external stimulants; in this attempt, however, we shall generally fail, when we must evacuate it by making a considerable opening, so as to admit a free escape of the fluid, which will again form; or what will still be better, we may insert a seton through the tumour. After this a solution of blue or white vitriol should be injected, so as to stimulate the sides of the cavity and produce an altered action. After some time pus will be secreted instead of serum, and then the part will soon get well."

The hard kind of tumour must be treated in another way; and the only way it can be, to be effectual, is, at once to make an incision down the middle of the tumour, and dissect it completely out, then insert a pleget of tow, smeared with No. 1 ointment above, and sew up the wound until within an inch and a half of the bottom, which orifice must be kept open during the suppurative process; but when that has stopped, dress as for a common wound, with compound tincture of myrrh.

THE KNEE.

Sometimes enlargements on the knee take place, but they are of little consequence.—A tumour about the size of a walnut formed on the knee of a horse. It was punctured with a very small abscess lancet, the matter squeezed out, the part blistered, and the horse ordered to be turned out. In a month, he came up, and no person could discover the place that either the puncture or blister had made. The horse was of great value. The same line of practice we would recommend in all similar cases, as it is simple, and not likely to be attended with much danger; whereas a more complicated course might be followed by evil consequences. Where a simple mode will effect our object, it is always best to adopt it.

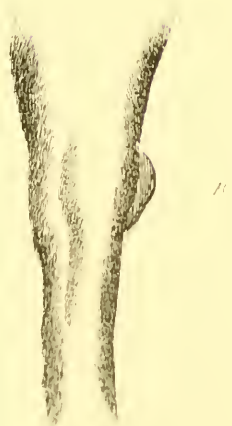
The fore leg at the Elbow in the healthy state
A The Elbow

The fore leg the Elbow being tumified
B The tumour C The place to operate on with the Bistory

D The situation to cut down on the tumour when intended to be dissected out

TUMOUR OF THE KNEE.

The Knee in the healthy state



B The tumour in the operation

CHAPTER XV.

THE EYE AND ITS DISEASES.

THE EYE IN GENERAL—THE MUSCLES OF THE EYE.

In speaking of the muscles of the eye, the *orbicularis* first comes under our notice. This muscle surrounds, and is attached to the bones of the orbit. It passes under the loose skin of the upper eyelid, which has great motion; and its office is to close the eyelid perfectly, or to assist in performing the involuntary act of winking. The antagonistic muscle to this is the *levator palpebræ*, rising from the posterior part of the orbit, and passing over the orbit, contiguous to the *lachrymal glands*, which are placed in the hollow of the orbit above the eye. This pair of muscles is in almost unceasing action, and like all other muscles would become weary; but by acting in opposition they obtain intervals of rest. Thus, when the eyes are shut, the *orbicularis* is in action; but when awake, the *levator palpebræ*. This last, however, is relaxed by the act of winking, which is clearly *one* intention of winking: another is to allow the tears to pass over the orbit for the purpose of removing extraneous matter, by means of the action of the eyelids.

To accomplish the various movements of the eye, there are four straight muscles, two oblique, and one retractor, or drawing-back muscle, the powers of which are very superior to those in the muscles of the human subject. Returning, however, to the straight muscles, we commence with the *levator* ones, which rise from the posterior part of the orbit, pass over the retractor muscle, and are attached to the *sclerotic coat*. They are for the purpose of directing the eye upwards. The eye always acts in unison with these muscles. The next are the *abductor*, which originate in the posterior part of the orbit, and are inserted into the anterior part of the *sclerotic coat* on the outside. These direct the eye from the nose. The *depressors* rise in the posterior part of the orbit, and are inserted into the inferior part of the *sclerotic coat*. The *adductors* have the same origin, and are inserted into the *sclerotic coat* towards the inner *canthus*. All these muscles acting together, have the power of drawing the eye into the *orbit;* but their action is inconsiderable.

The *oblique muscles* are two. One takes its rise from the inferior part of the orbit, and is inserted into the *sclerotic coat* below. The other, called the *trochliaris*, also rises in the same part, and going through a pulley-like adaptation, is inserted into the anterior part of the *sclerotic coat*, and thus draws the eye forward. The principal use of these muscles is to act in opposition to those which are straight, by drawing the eye forward.

The *retractor oculi*, rising from the superior part of the orbit, surround the *optic nerve*, but are separated from it by adeps (*i. e.*, fat); and that the fibres may not affect the nerve, they are not attached to the *sclerotic coat*, where the nerve emerges. Here we may mention how the *inner and outer canthus* may be distinguished. When the eyes are separated from the body, it is the broad side which forms the inner *canthus*, over which the *haw* plays. In the structure of birds, for example, there is an organisation somewhat similar to the *haw* in the horse, called the *membrana nictitans*, a semi-transparent membrane, having a muscle and a tendon. In the horse this is cartilage, edged with black, at the anterior part fastened to the *conjunctiva* by the cellular membrane; and if an attempt is made to pass the finger between the eye and the haw, the action will be prevented by the *conjunctiva*, showing that the *conjunctiva* is a reflected membrane over the cellular attachment. The *haw* is divided into two parts. The anterior part is convex on the outer surface, and concave on the inner, to fit the convexity of the eye. The *haw* acts as a kind of shield; but not being sufficient to cover the whole orb, whilst in its natural situation, the *retractor muscle* acts first, by which means the ball of the eye presses upon the *adeps*, and the *haw*, in consequence, is forced

over the eye, showing that it has no separate movement, but is dependent on the *retractor muscle*, and performs its functions by moving a part to which it is least attached.

The *lachrymal glands* are placed above the *levator palpebræ*, lying close to the *sclerotic coat*, and moisten the eye.

The eyelids are peculiar in the horse. The bottom one has no lashes, but the upper one has a double row in the centre, but not extending from *canthus to canthus*. They are seldom diseased, or even the cause of disease.

The *conjunctiva* is immediately connected with the eyelids, the haw, and the *orbit*. It possesses three different structures; that is, three separate degrees of vascularity. It lines the inner surface of the eyelids, and covers the eye-ball, being reflected over every part. This membrane is highly vascular in that part which lines the eyelids, and is less so over the *opaque cornia*, and still less over the *transparent cornia*, never admitting red particles of blood, unless in a state of inflammation. The eyelids possess a secretion of their own, to protect them from the tears, which, though congenial to the eye, are not so to the edges of the *palpebræ*. It is a well-known and somewhat singular fact, indicating the different degrees of susceptibility to which different parts of the animal structure are liable—that the salt that is in tears will at any time inflame the cheek, but not the eye; whilst warm water applied to the eye, will inflame it, and be congenial to, and relieve the cheeks.

The apparent use of the eyelid is to protect the eye from foreign matter, and also to regulate the admission of light. Independent of these, the inner surface of the upper eyelids, covered by the conjunctiva, is connected with the tears, which flow between the eye-ball and the lid, the conjunctiva being thus prevented from coming in contact by a fluid. The eyelids also secrete a fluid of their own, which prevents any tendency to irritation. The action of the lachrymal glands is carried on, at intervals, even in sleep, though there may be but little wanted; but any foreign matter, even the wind, will excite their action. This is occasioned by the nerves of the eye-ball being irritated, and the tears, in consequence, being thrown out to alleviate such irritation. Between these glands and the mental character of the horse, there is also great sympathy; and when their action is excited, so that the secretion has become too great to be carried off by the nose, the tears flow over the cheeks, which constitutes weeping. This secretion is also affected by the action of the retractor muscle, which, operating with the adductor muscle, the eye-ball is brought to the inner canthus, and the haw forced over the eye-ball. Extraneous matter very seldom occasions blindness; for the tears and the eye-ball moving in one direction, and the haw in a contrary one, any such matter is quickly dislodged.

The use of tears is to keep the parts moist and transparent, and to remove the waste from evaporation, which is always going forward in moist external surfaces. Having performed their office of lubricating the eye-ball, and the parts attached, they pass into the duct, called *puncta lachrymalis*, situated at the inner canthus of the eye. This duct in the horse is little larger than in the human subject, and passing through a canal, partly bony and partly membranous, terminates at the lower end of the nostrils, much increased in size. The construction of this junction in man is much more complicated than it is in the horse, and is very frequently subject to disease by becoming obstructed. In the horse this very seldom occurs; and when it does, it is attended with but very trifling inconvenience. The action of the haw takes place from any cause which produces pain or inflammation; and this may be continued so long, that the retractor and adductor muscles will permanently contract, when the haw, being completely powerless of itself, is left protruded out. When this is the case, there is no difficulty or danger in cutting it out with a pair of scissors.

In the horse there is no opaque cornea visible; whilst in man, it constitutes a prominent feature of the organ; and although it does not appear to give any additional perfection to the vision, it adds greatly to the beauty and expression of the eye.

The transparent cornea is more or less convex in all animals. In horses, it is not circular, but horizontally oblong, being more contracted at the outer than the inner part. The ball of the eye is also denser and more transparent. By a law of optics, the rays of

light pass through a transparent *convex* body, and become bent, whilst conveying objects to a *focus*, which again conveys them to the *retina*, thus constituting vision. In some men the cornea is frequently too *convex*, in consequence of which the rays of light are brought to a focus before they reach the *retina*. This constitutes near-sightedness; the reverse taking place with old people, the cornea being too flat. Of defective sight in the horse it is more difficult to judge; but there is no doubt that many horses with prominent eyes, and very convex, have imperfect vision, as they, invariably, are very apt to shy, or to start.

In examining the eye, and looking into the anterior chamber, which contains the aqueous humour, the *iris* appears, the centre of which is perceived in the opening called the *pupil*. Looking steadily at it, there is a blueness apparent, showing that there is free access to the back part of the eye through the pupil, and also showing that the iris divides the humours of the eye into two spaces, which are called the anterior and the posterior chambers. The iris appears to hang as a curtain between the cornea and the *crystalline lens*, and is composed of two orders of muscular fibres. It demonstrates the colour of the eye; as, for instance, when it is black, or blue, it forms an eye of the same colours. In bay horses it is of a cinnamon colour. Sometimes it is white, constituting a wall eye, with which there are generally associated white hairs on the eye-lashes and orbit. The colour of the outer part of the iris is no criterion for the posterior, which is generally black, and is the part that is of service to the sight of the animal. The shape of the iris, at the circumference, is oblong, like the transparent cornea. It is very muscular, and its fibres are radiated, and wound round the circumference with another order of muscular fibres. Another order winds round the inner margin, and the union of the two is by the radiated expansion of one order of fibres and of the blood-vessels.

The opening of the iris, or *the pupil*, is not a solid body, but a passage left for the rays of light to penetrate to the posterior chambers of the eye. The iris undergoes many changes, as to size, in all animals. In the horse it changes its form, from round to oblong, and *vice versâ*. In cats, the changes are well seen; for, in a strong light it becomes extremely oblong, but perpendicular; whilst in the horse it is horizontal. The object of this adaptation is at once obvious. In order to secure its prey the cat has to look upwards and downwards, but not laterally; whilst the horse has to look in all directions; so that, although the pupil becomes horizontal, it is never very narrow. There is also, in the horse's eye, a peculiarity of structure which seems to have the power of excluding light. This is effected by four glandular bodies, two placed at the lower edge of the upper margin of the iris, and two at the lower margin. These are not seen in a weak light, when the pupil is large; and seldom in the dead subject; but make their appearance in prominent eyes, under a strong light. They are black, and covered with the *nigrum pigmentum*, or black paint, which, in the dead eye, becomes a mucous. These bodies may almost be called an internal eyelid, and, united to the iris, they complete the curtain.

By observing the effect of different degrees of light on the iris, it will be seen that it becomes stimulated by the action of the rays, and expanding, through the nervous energy, makes the pupil much smaller. On the other hand, if the iris contract, the pupil appears so much larger. This portion of the optical organ is possessed of an abundance of nerves and muscular fibres. The muscular fibres are of two orders, the one appearing a kind of *sphincter*—signifying to shut up—at the inner margin, and which when excited by a strong light, at the same moment, contracts. The transverse order relax and elongate, and thus the pupil is diminished. The stimulus of light being removed, the transverse preponderate and diminish the iris, whilst they enlarge the pupil. It would appear that the circular or sphincter order, require a very strong stimulus to be able to overcome the constant superabounding power of the transverse order, the varied action of the pupil taking on different forms, according to the strength of light. In a weak light these become circular, from the transverse fibres being in full play; but, as in a strong light the pupil becomes oblong, it would appear that the transverse fibres have not an equal power of relaxation, except at the top and bottom; for, at the corners, they scarcely relax

at all. There is considerable sympathy between the iris and the retina, as in cases of *gutta serena*, or glass eyes, as it is termed; or when the optic nerve and the iris have lost their sensibility.

In considering the outer coats of the eye, we will commence with the *sclerotic*, which is composed of tendinous material, very dense, but not equally thick all over, the thickest part being its posterior. This part, as it receives more pressure against the orbit, when under the influence of the retractor muscle, nature has proportioned the means to the end, and made it thicker, in order that it might be capable of repelling the pressure it was destined to receive. Anteriorly, there is a groove receiving the posterior edge of the transparent cornea, called the *ciliary processes*—the white folds at the margin of the *uvea* in the eye, covered with black matter; there is a passage through the *sclerotic* coat for the optic nerve, which does not pierce it at its centre, but pierces the *sclerotic* and *choroid* coats at the inferior part.

The *choroid* coat is on the inner side of the *sclerotic*, and is very vascular, possessing many blood-vessels, nerves, and absorbents. Its appearance varies in different animals. In white ferrets, and also in those classes of persons commonly called "*albinos*," with long white hair, the colouring matter is wanting, and the arteries of the coat are alone seen. The consequence is, the bottom of the eyes look red. Where this formation exists, there is an incapability of seeing in a strong light, objects being best seen in the dark, which is most properly called *a diminution of light;* and in sympathy with such, the eye-lashes are always white, and the hair of the head white also. Frequently in smaller animals all the hair is white, as we find in white mice and white rats. In man, generally, both surfaces of the *choroid* coat, the one in contact with the *sclerotic* coat, the other with the retina, are covered with a black pigment, which, in the dead animal, becomes a kind of mucus. But here there is a difference according to circumstances. Negroes have it much blacker than the inhabitants of temperate regions, and have a power of absorbing superfluous rays of light, to an extent that renders vision even painful. This coat, in horses, is of great importance. All the pigment or colouring matter below the optic nerve, being about one-third of the whole, is black, but above it is green and blue, which are separated from the other by a distinct hue. This compound, in the living eye, imparts to it the appearance of sky-blue, which, seen through the humours, is of *a greyish hue.* Horses frequently, and by very eminent men, have been pronounced unsound from having this grey cast or shade in the eye. The optic nerve having pierced these two coats within, the black covering is lined here with a little pigment. It is then distributed over the whole of the surface, as far as the junction of the opaque cornea with the ciliary processes. The object of this variegated coat, and why it should occupy the superior part in particular, is, that the rays of light may pass through the nerve going beyond the retina. In man, from the colour of the pigment, the rays become absorbed, and terminate accordingly; but in a pigment that is not black, they do not terminate, but are reflected back, striking the nerve a second time, and the effect is then an increased degree of vision. In the horse, the rays strike the nerve twice, but *only at the upper* part, where the green pigment is situated. The rays thus received are obviously the weakest, especially when the head of the animal is near the ground, which is his natural position when in the act of grazing; the black pigment then receives the strong superior rays; and thus by a skilful combination the light is equalised, and sharp keen sight produced.

"The reader may see in the dusk, or even when duskiness is fast yielding to utter darkness," says Mr. Youatt, "the beautiful sea-green reflection from the eye of the horse. . . . If the reader has not examined this beautiful pigment, he should take the earliest opportunity of doing so. He will have a beautiful illustration of the care taken by the Supreme Being that each shall suit his situation. The horse has not the intelligence of man, and may not want, for any purpose of pleasure or improvement, the vivid picture of surrounding objects which the retina of the human being presents. A thousand minute but exquisite beauties would be lost upon him. If, therefore, his sense of vision may not be so strong during the day, it is made up to him by the increased power of vision in the night."

The crystalline lens is not exactly a perfect lens, the anterior side being rather the flattest. It is contained in a perfect capsule or bag, a fluid separating the capsule from the lens, which is called the *liquor morgagni*, from M. Morgagni, the name of its first discoverer. This capsule does not adhere to, but is confined in its position by the *tunica vitrea*, being reflected over its edge, at which part, also, it is surrounded by the *choroid* coat, formed into folds, called the ciliary processes. It was formerly doubted how these parts grew; but doubts were dispelled on its being discovered that both arteries and veins are situated in these parts. The lens is not only flatter anteriorly, but is not of the same structure throughout, the outer surface being like a mucus or jelly; whilst within, it becomes harder, even to the centre. From this arrangement the rays of light are bent from one degree to another, in proportion as they approach the centre—the crystalline lens acting as a refracting glass, receiving the rays, in some measure refracted by the cornea and aqueous humour, and bringing them to a focus on the retina.

"When either the cornea or the crystalline lens is too convex," says Mr. Spooner, "the object is brought to a focus too soon, and vision is indistinct, and the person near-sighted." This, he adds, as we have already observed, is a frequent defect in the eyes of horses that shy, in which we often find full goggle eyes. When, however, the cornea or the lens is too flat, a contrary effect is produced, and the object is not converged soon enough. This is often a complaint in old people, who are relieved by convex glasses, whilst the former defect is relieved by concave lenses.

The iris has an involuntary power of changing under different degrees of light. It also has another power independent of the effects of light—namely, that of looking at a minute object, though the light be weak, and becoming larger as the pupil gets smaller, and *vice versâ*. The pupil being small, the rays are confined to such as proceed from the object alone. Thus there is no confusion of images on the retina, but the smallest object is seen; and, as in the last instance, when the object to be seen is large, the iris contracts, that the rays may be admitted from all parts for a perfect representation.

In examining the *ciliary processes*, they are nothing more than a continuation of the choroid coat which surrounds the capsule of the crystalline lens. They are called choroides, and are the actual foldings of that membrane. Their object is to prevent the passage of any rays of light on the outside of the lens, which otherwise would render vision imperfect.

The vitreous humour is of a peculiar composition. Although it seems to be a kind of jelly, it is not; but nearly of the same fluidity as the aqueous humour. This appearance arises from its being contained in cells, and not in a single capsular bag. A proof of this is found in the breaking of the cells, when the fluid drops freely. It is also admirably formed; for being in contact with the expansion of the optic nerve, it cannot alter its position, or be injured by pressure.

The phenomenon of vision is both curious and grand. In the first place, all objects to be seen require a sufficient quantity of light to render the optic nerve sensible. Although different animals require different degrees, man requires the most—a fact demonstrated by the construction of his eye, which has a small transparent cornea, and a black pigment. The vision, to be perfect, must be painted on the retina; and here is a curious fact, that though we have two eyes, we see only one object; yet there is an object painted on each retina, but only one on the *sensorium*. Being possessed of only one sensorium, so long as the object is the same, there is only one impression formed; but immediately objects change, there are different impressions formed. All objects on the retina being painted upside down, the rays of light cross each other, and meet in a point near the lens, when they proceed through the vitreous humour nearly in the same right lines.

Objects presented to the eye have their images painted on the black part of the retina, the rays of the incident pencils converging to their proper foci there, by the refraction of the different humours; and for this office they are admirably adapted; for as the distance between the back and front of the eye is very small, and the rays of each of the pencils that form the image fall parallel, or else diverging on the eye, a strong refractive power is necessary for bringing them to their foci at the retina: but

each of the humours, by its peculiar form and density, contributes to cause a convergence of the rays: the aqueous from its convex form; the crystalline by its double convexity and greater density than the aqueous; and the vitreous by a less density than the crystalline, joined to its concave form.

The structure of the eye is in general adapted to the reception of parallel rays; but, as the distances of visible objects are various, so the eye has powers of accommodating itself to rays proceeding from different distances by altering the distances of the crystalline from the retina, which is done by the action of the ciliary ligaments. We will now speak of the diseases of this organ.

INFLAMMATION.

The conjunctiva is that membrane which lines the eyelids, and covers the cornea and the haw of the eye. Its inflammation is one of the most common diseases to which this orb is subject.

When inflammatory appearances have become manifest in this part, the first thing to be ascertained is, whether the transparent cornea is affected or not. One sign is, that the iris, at the border of the pupil, will not be seen without difficulty. Attention must then be directed to the other eye; and not finding the pupils exactly alike as to size, &c., it may safely be inferred that the smallest is in a state of disease; the sphincter muscle of the iris having become contracted from sympathy. The next thing to be observed is the blood-vessels of the membrane under the eyelid. If these appear turgid, and even if there is only one of them shooting into the transparent cornea, it is a diseased eye. Attention must then be directed to the glandular bodies at the upper edge of the iris; and if these are not alike in colour, it may be predicted that the horse will go blind from the effect of little lymph being lodged there from previous inflammation. The haw is likewise a criterion to go by. If the haw is not the same in each eye, but one protruding more than the other, the indication is bad. These incipient appearances of this disease are of great importance; for as this disease is the one to which the horse is most usually subject in the eye, it should be vigilantly watched, as it frequently results in blindness.

This disease generally comes on in the night, and is then thought of but little moment; the groom supposing the eye to be injured by the halter, or by rubbing it against the manger, or some rough place in the stall; but this is seldom the case; and, as to producing it by blows, it is exceedingly difficult to wound the eye. If, however, it should be occasioned by a blow, there will be an abrasion on the external surface; on examining which, it will be easy to determine how to proceed. Take of

Extract of Saturn . . . 4 drachms ($\frac{1}{2}$ oz).
Spring water sufficient to fill a common-sized wine-bottle.

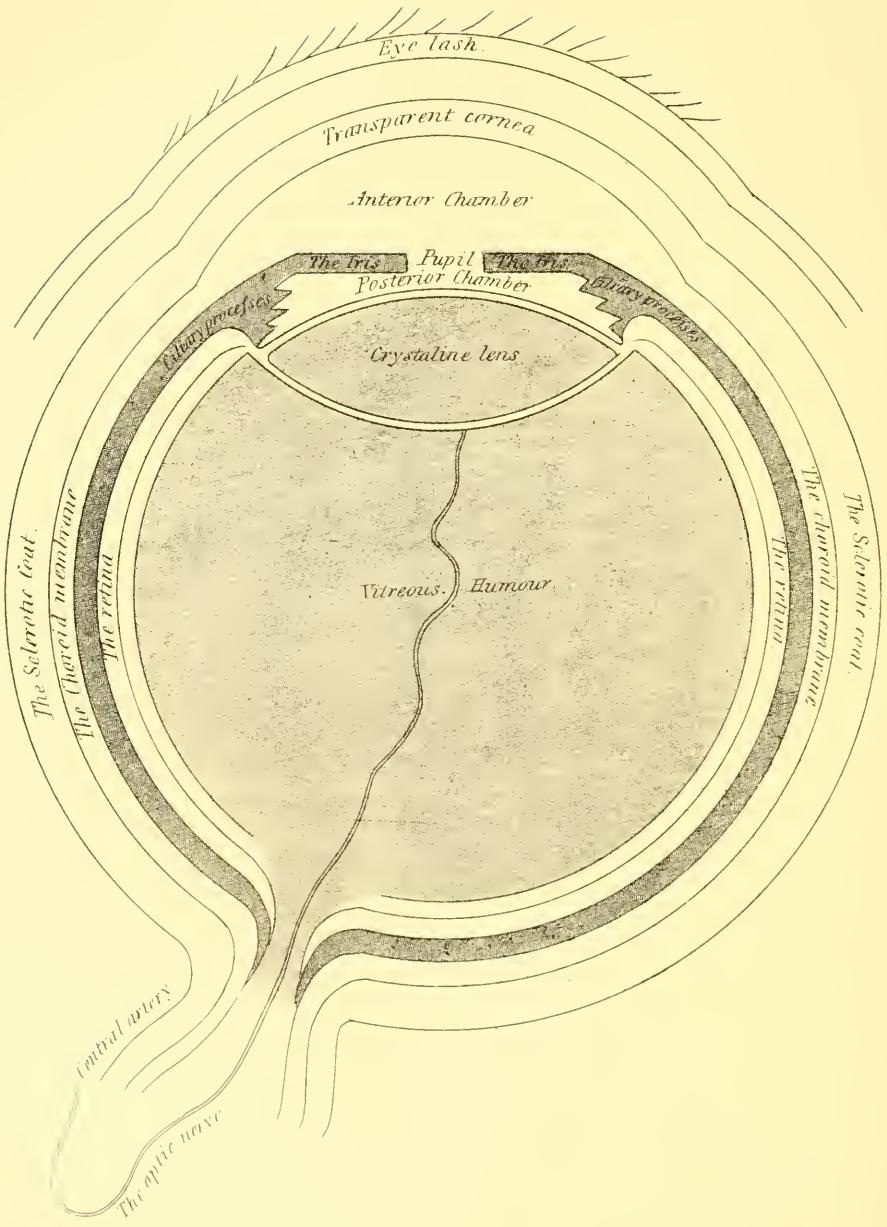
Apply this lotion frequently every day. Or,

Take Sulphate of Zinc . . . . . 1 oz.

Dissolve in the same quantity of water as above. Either of these recipes, if the inflammation arises from a blow, will effect a cure in a few days.

This disease does not often attack aged animals, if they have not been previously affected with it. They are most subject to it between four and six years old, when their growth is becoming nearly completed, and when, if highly kept, a plethoric habit is produced; the solids of the body ceasing to grow, and the deposit of fat becoming greater than the system requires. Young horses are, in early life, but little susceptible to this disease. When an attack commences, if nothing is done to prevent it, the inflammation increases rapidly, until the pupil is hid, and the whole surface of the eye appears bloody. This, however, may be wholly removed. The attack flies from eye to eye; first beginning in one, then in the other eye, probably at the interval of some months, till one or both become blind. If one only is lost, the general opinion is, that the other will become perfectly sound, and be much stronger. From these circumstances it would seem not to be a local disease, but constitutional. It is produced generally by living in a poisoned atmosphere. In cases where it has appeared, it has been observed that the horses either do not perspire at all, or perspire profusely, from languor. The inflammation having its origin in the conjunctiva, all the other parts partake of it. The iris secretes pus, which falls into the posterior chamber, where absorption takes it up, or probably ulceration takes place. Even the constitution appears to undergo a

DIAGRAM of the HORSE'S EYE.



change, when blindness ensues. This periodical ophthalmia generally ceases when one or both of the eyes go out, although, at first sight, one cannot tell how the constitution has been affected by the loss of this organ, or see a reason why the inflammation should not recur at intervals.

The disease may also arise from the effects of purging; but this only causes the constitutional tendency to the disease being brought into effect, producing debility from the medicine becoming the exciting cause. The disease then is constitutional, and requires effectual remedial measures to be adopted. Take of

Blue Pill	12 drachms.
Opium	2 do.
Linseed Meal	1 oz.

Form into a mass with soft soap,

and divide into six balls. Give one every second morning fasting. Or, take of

Sulphate of Copper	12 drachms.

Or, of

Sulphate of Iron	12 drachms.

Form either of these into a mass with linseed meal and soap, and divide into six balls, and give one every morning about eleven o'clock. These two last are strengthening, and when the disease arises from debility, will be found of essential service. Bleeding generally, according to the strength of the animal, should not be omitted, as it will relieve it in all its stages, though not eventually cure it. A good lotion may be composed of

Common Salt, a table-spoonful and a-half.
Spring Water, as much as will fill a wine-bottle.

Bathe the eyes several times in the day with this; or, take either of the lotions prescribed for blows in the eye.

The insertion of setons between the jaws have done good for a time; and considerable benefit has arisen from the following prescription—

Tartar Emetic	1 drachm.
Hog's Lard	1 oz.

Form into an Ointment.

Rub a little on the side of the horse's cheek, and also underneath the eye, until small pimples appear. Great care must be taken to prevent its going into the eyes.

For simple ophthalmia, local and general bleeding and physic are advised. Warm fomentations should be at first used, and the following lotion applied six or eight times a day:

Cold Water	1 pint.
Tincture of Opium	1 oz.

When the inflammation has abated, but a film is still left on the cornea, apply with a camel's hair brush, twice a day, a few drops of the following:

Distilled Water	1 oz.
Nitrate of Silver	1 or 2 grains.

The horse should be kept in a cool and clean stable, where there are no offensive exhalations from manure.

Mr. Peall relates an experiment which he made on a horse affected with ophthalmia. "I have ordered him," he says, "to be removed from the stable, where I observed he kept both eyes shut, into the open air, or to a very cool situation, and have watched the effects of the change. In the course of half-an-hour I have commonly found him begin to open his eyes gradually; and in the course of two or three hours, to keep them open boldly, and for a continuance, even though the situation he was placed in was not darkened or shady; for it cannot be denied that strong light is very prejudicial in such cases. Now to prove that the stimulus of the volatile alkali—the vapours of foul litter—was more offensive to the inflamed organ than that of light, I have placed the animal again in a hot stable, which did not admit much light, and, in the course of a few minutes, have observed him begin to close his eyes gradually, and, after an hour or two, to keep them constantly shut. Not satisfied, however, with this, I have removed the horse back again to a cool situation, and have observed the same effects to be produced as have been already detailed."

CATARACT.

The common termination of the foregoing disease is cataract; which is inflammation in the capsule of the lens with opacity. The opacity invariably begins in the centre, from its being the hardest, and having less of living power, so that the circulation becomes more easily affected. There being no simple cataract in the horse, many appearances of the lens take place when the eye is affected by the disease. In some, a general determination of

blood to the coats of the eye, when irritation ensues. The retractor muscle then acts from sympathy, which produces pressure on the *tunica vitrea*, and the cells of the vitreous humour are destroyed, together with the capsule of the lens. To prevent the lens floating about, lymph is thrown out, forming an artificial capsule. By this action of the retractor muscle, the aqueous humour is pressed upon by the lens through the other parts, and this humour against the transparent cornea. To prevent the eye from bursting, the humour becomes absorbed; the lens is thrown against the iris, which dilates, coming in contact with the transparent cornea; the pupil in consequence becomes lost. From these complicated effects, an operation is both difficult and useless. It has been performed several times at the Royal Veterinary College. But even if imperfect vision is restored, it is detrimental to the horse, causing him to shy, and rendering him unsteady and dangerous. When cataract occurs in the human subject, couching is practised; but, in the horse, this is all but impracticable.

GUTTA SERENA, OR AMAUROSIS,

Is another disease of the eye of the horse, consisting of a paralysis of the optic nerve, which becomes insensible to the light, though admitted through a perfect organ. It is much more common in the human subject than in horses. Blistering behind the ears, on both sides, has been repeatedly tried for it, but without any success. Rowels between the jaws, kept open for a length of time, have also been tried, but without any satisfactory result.

On one occasion, a young veterinary surgeon, just emanated from the Royal Veterinary College, and who had not seen any practice previous to his going to that establishment, was called to a horse affected with inflammation of the eyes. He at once pronounced the necessity of taking blood; but being rather a timid operator, he, in striking the phleme, only just touched the jugular vein, the blood scarcely deigning to flow. Consequently he pinned up that side, and proceeded to the other, with no better success. The result was, that the horse's neck became greatly swollen, and though it was well bathed, it had no effect. Suppuration took place, and the horse lost the vein on both sides: but while this was going on, the inflammation entirely left his eyes. The gentleman to whom he belonged kept him for two or three years after, but no inflammation ever returned.

Gutta Serena has followed an attack of stomach staggers, and, in many instances, has come on from excessive loss of blood after castration, and from ruptured liver. It has, also, appeared in a temporary form after apoplexy, and during gestation.

In treating for it, copious bleeding at the neck, followed by a dose of physic, is recommended. Local applications to the eye are of little service.

When the disease proceeds from the liver, stomach, or any other viscera, bleeding is not always to be adopted, but should be regulated by the general health of the animal. When the above treatment fails, calomel, combined with opium, may be tried, and, in obstinate cases, strychnine.

CHAPTER XVI.

WOUNDS—WOUNDS IN GENERAL; WOUNDS OF THE HEAD; CHEST; ABDOMEN; JOINTS; SHEATHS OF TENDONS; ARTERIES; VEINS; KNEES; GUN-SHOT WOUNDS; SUTURES.

WOUNDS IN GENERAL.

Wounds are a species of injury to which horses are not only perpetually liable, but they consist of so many different kinds, and require such various modes of treatment—according to the cause, appearance, situation,

depth, and state of the wound, or habit of the subject—that to discuss the whole of them with all possible or probable circumstances in which they appear, would be to write a volume on them alone. Even that space would, perhaps, not wholly be exhausted when we consider the simple and complex characters which they frequently assume, and the difficulties which, in numerous instances, are involved in their treatment. To enlarge, therefore, upon every probable means by which a wound may be received, is unnecessary; accordingly, we will exhibit their most prominent features, with the best means of their cure.

Wounds in general are subject to a great deal of variety, both in their nature and external appearance. The differences depend, in a very great measure, on the nature of the injured parts, the manner in which the wound has happened, and its extent.

Flesh wounds are, in appearance, nature, and degrees of danger, quite different from those of the tendons. There is also an essential difference between such as are made with a sharp-cutting instrument, and others, in which the fibres, besides being divided, have suffered considerable contusion and laceration. A wound made with a narrow-pointed instrument, is also of a very different nature from one that has an ample orifice.

The degrees of danger attending every wound, depend very much on some of the following circumstances:—

The extent of the injury; the more or less violence which the fibres of the part have suffered, besides their division; the nature of the blood-vessels, or nerves, which happen to be cut; the nature of the wounded part, in respect to its general power of healing favourably or not; whether the operations of the system at large, and life itself, can be well supported or not, while the functions of the wounded part are disturbed, interrupted, or suspended by the accident; the age of the patient, the goodness or badness of his constitution, and the opportunities which there may be of receiving proper aid and assistance of every kind.

As a general observation, we may state, that a wound that is made with a sharp-cutting instrument, and which takes the character of a mere incision, is attended with less hazard than any other kind of wound whatever. The fibres have only simply been divided. They have suffered no contusion, nor laceration; and are, consequently, less likely to inflame, suppurate, or slough, and likely to admit of being united again in a very expeditious manner.

Lacerated wounds, are those in which the fibres, instead of being divided by a cutting instrument, have been torn asunder by some violence, capable of overcoming their force of adhesion. The edges of such wounds, instead of being straight and regular, are jagged and unequal.

Contused wounds is a term applied to such as are occasioned by some blunt instrument, or surface, which has violently struck a part of the body.

Lacerated and contused wounds differ from simple incised wounds, in appearing, at first view, much less alarming than the latter, while in reality they are much more dangerous. In simple cut wounds, the retraction of the parts, and the bleeding, are generally much more considerable than in a lacerated wound of the same size. Notwithstanding these circumstances, however, they commonly admit of being healed with far greater ease. Indeed, lacerated and contused wounds are scarcely ever attended with any serious effusion of blood, even though some large blood-vessels may be injured. In judging of the severity of these, this is apt to lead some persons, even practitioners, astray; for, in proportion as there is little bleeding, it may with safety be concluded that serious violence has been done to the fibres and blood-vessels.

A punctured wound is one that is made with a narrow-pointed instrument, and has its external orifice small and contracted, instead of being of a size proportionate to its depth. A wound produced by the thrust of a sword or bayonet is an example of a punctured wound.

Wounds of this description are in general infinitely more dangerous than incised ones, notwithstanding the latter have the appearance of being by far the most extensive. The degree of danger, in cases of punctured wounds, always depends on the additional injury, and rough violence, which the fibres have suffered, besides being divided.

Some of the disagreeable consequences of

such wounds are also imputed to the frequent great depth to which they are liable to extend. In consequence of this, important parts and organs are often injured. Such cases are less easily cured, owing to the difficulty of extracting any extraneous substances which may happen to be lodged in the wound. All punctured wounds and stabs are at the same time dangerous, inasmuch as they are particularly apt to be followed by a considerable amount of inflammation, fevers, deep-seated abscesses, sinuses, &c.

Wounds of this description are, in this country, not very common. The stings and bites of certain insects, and the bites of vipers, mad dogs, cats, &c., are the only instances which we meet with. The only insects to be dreaded are the stings of the wasp, or the hornet. This insect, to appearance, is the most formidable creature of the winged tribe in Britain, the sting being frequently attended with the most acute pain and inflammation. Even the sting of the wasp, should it occur where the skin is thin, such as on the inside of the thigh, occasions extreme pain and irritation.

WOUNDS OF THE HEAD.

Wounds of the head of the horse do not so frequently occur as might be expected. The principal occur on the ears, the eyelids, the nose, or the salivary gland or duct. This duct is situated at the angle of the jaw, where the pulse of the animal is felt. It is sometimes liable to be torn, when the saliva escapes by it, instead of passing on to the mouth to mix with the animal's food. It also frequently occasions great debility.

From the situation of the parotid duct, and its liability to become wounded, what is called a salivary fistula may be the consequence, unless steps are immediately taken to afford relief. The cheek and face become considerably swollen; to prevent the increase of which, the actual cautery should be used. A budding-iron, however, is the best instrument; after using which, draw the lips of the wound together with a suture, and apply adhesive plaister over the whole, in strips, about a quarter of an inch apart, first cutting the hair close off all round the part, that the plaister may adhere more firmly.

Lacerations of the horse's ear sometimes occur. In such cases have him cast, and the lacerated part cut off. After this operation, if it should not look at all pleasant, remove as much more as will make it do so; then crop the other ear to correspond. This is the only method that can be pursued, as, from the little vascularity of the ear, it being principally composed of gristle, union cannot be expected to take place.

The eyelids frequently become lacerated, and very much torn, from nails or splinters of wood about the rack, manger, or standing. In this case, a small curved needle, with whity-brown thread, should be taken, and sutures introduced in such a manner as to bring the parts as much in contact and as near to the appearance they had before the accident took place. After this, use the following:—

Sulphate of Zinc	½ oz.
Spirit of Wine	2 do.
Water	16 do.

Apply this lotion to the parts affected three or four times a day.

Wounds of the nose, or nostril, sometimes occur, and are exceedingly difficult to heal, in consequence of our not always being able to apply proper remedies. The only thing to be done is to sew up the lacerated parts, and apply compound tincture of myrrh, as in a common wound. It is difficult, in such cases, to recommend another distinct mode of treatment without the real nature of the wound is perfectly ascertained.

WOUNDS OF THE CHEST.

These wounds occur mostly in large towns, where there is considerable movement with all kinds of vehicles; when the shaft of one carriage comes in contact with the horse of the one he may chance to meet, enters his chest, and often causes immediate death to the horse. In such cases the first thing to be ascertained is the depth of the wound; and, in order to restrain the rapid action of the circulation, copious bleeding must be used. A piece of tow, well smeared with digestive ointment, should be introduced into the wound, in order to procure a discharge as soon as possible. The horse should be kept without food for at least twelve hours; at the expiration of which,

a ball, composed of the following ingredients, should be given:—

Aloes	4 drachms.
Rosin	2 do.

Form with soft soap and linseed meal.

If, by this time, the parts should have become much swollen, bathe them well with hot water; and if the discharge is once produced, it is a sign that the animal is going on well. Continue the dressing, with the medicine occasionally, and a cure will soon be effected. Should the wound, however, not have been made in the direction before named, but have entered the cavity of the chest, and the lungs become in any means ruptured, the case is then hopeless. This will easily be ascertained by air rushing out of the wound, and by the peculiar scarlet hue of the blood.

If swelling should take place between the legs, or under the chest, take the phleme and strike it, to let out the air which has been extravasated.

WOUNDS OF THE ABDOMEN.

Wounds of the abdomen generally arise from the horse having been gored with the horns of some mischievous bull or cow, whilst in the field, or by his having been staked, or not unfrequently by some of the hooks carelessly attached to the harness. These have sometimes been the cause of frightful lacerations, when lock-jaw has been known to supervene.

When they are so severe as to penetrate the cavity of the abdomen, they are attended with much danger. If any of the intestines should protrude, they should be carefully replaced, unless they should be very cold, or mortification appear; in which case the parts should be well bathed with warm water, not too hot at first, but made warmer by degrees, until it approaches to blood-heat; then, after returning the intestines, sew up the external wound, and apply a roller, padded, to the part. Neither food nor water should be given, but clysters of gruel, and also gruel as a draught; but this sparingly at first. When the roller is to be removed it should be done with the greatest caution; and if appearances are favourable, a pleget of tow, and a large adhesive plaister over the whole; then the padding and the roller should be applied as before. In such cases copious bleeding should be used, as soon as the first dressing is over. If mortification should have taken place, the horse will soon evince it; but, should better fortune attend the treatment, he must be brought on by degrees, and not be fed too freely for some time.

WOUNDS OF JOINTS.

From the tendinous and membranous nature of the parts which surround the large joints, wounds in them, whether of a punctured or incised kind, are attended with great danger; and, although these joints are not very sensitive in a sound state, yet, when inflamed they become exceedingly so, and frequently are the cause of violent pain and fever.

Superficial wounds of the joints are often disagreeable cases; but the danger is always increased when the injury penetrates the capsular ligament. When this is the case, it may be detected by the introduction of a probe, and frequently by a discharge of the synovia, which is secreted by the inner membrane of the capsular ligament of the joint, for the purpose of facilitating its motion. But as a discharge of a similar kind may proceed from mere wounds of such (*bursæ mucosæ*) synovial bags, as in the case of windgalls, &c., that lie under the tendons of muscles, in the vicinity of joints, we might be deceived, were we not acquainted with the situation of these little membranous bags. Wounds which penetrate large joints, must be held as much more dangerous than those in which only these *bursæ* are opened.

Almost all the joints of the horse are liable to be laid open, and their cavities exposed. The stifle, the pastern, and the knee, have been seen all at once, completely exposed; but the knee-joint is, of all others, the most frequently liable to accident. It does sometimes occur to the shoulder-joint, but very rarely. When a joint is penetrated, there is an escape of synovia, or, as it is commonly called, joint-oil. In consequence of the escape of this fluid, the ends of the bones are brought together, occasioning, in conjunction with the air getting in, considerable inflammation through the whole extent of the capsular surface, and causing that exquisitely tender sensation which the horse feels on having the joint touched. In some cases the fever runs so high as to prove fatal. An instance of this occurred at the Royal

Veterinary College. A large cart-horse was brought in with an open joint. Ultimately the opening closed, but new granulations formed, and a wound about the size of half-a-crown was the consequence. This wound was ordered to be dressed with spirits of turpentine, which was accordingly done; but, from symptomatic fever, the animal died in three or four days. When a joint is early discovered, after being penetrated, the synovia will flow white and pure, or it may have a little tinge of blood in it; but, if the accident is not discovered for three or four days, the joint-oil will be found to put on a yellowish colour, and the discharge be considerably increased. If means are not speedily taken to close the external opening, coagulable lymph is thrown out; and in consequence of the inflammation being great, the vessels may inosculate together, and in all probability a stiff joint will supervene. In some cases, the pain and irritation are so great, that the animal either sinks under it, or becomes a mere skeleton. But this need not be considered a matter of surprise, when we reflect on the treatment of the old farriers, who, in general, made use of strong stimulants, taken from their long list of infallible nostrums.

The treatment of open joints, if discovered in their recent state, may not be so difficult. The first object to which attention should be directed is to remove all extraneous matter, such as dirt, gravel, and any other substance that may aggravate the affected part. Then proceed to close the wound, which must be first commenced by clipping off the hair for some distance all round it. If not large, strips of adhesive plaister should be applied, drawing the lips of the wound as closely as possible together, and placing over them a pleget of tow, and immediately after a linen bandage, about three yards long, and four inches wide, so that the shutting-up of the cavity may be complete. In addition to this, the symptoms of irritation, both local and general, must not be neglected; for if the symptomatic fever is high, the case must be treated accordingly. This will be discovered by the animal having lost his appetite, the heat and dryness of his mouth, as well as the quickness and weakness of his pulse, and his breathing short. If these are the symptoms—which in all probability will occur—immediately take from two to four quarts of blood, and give the following ball:—

No. 1.

Cape Aloes	1 drachm.
Digitales	2 do.
Linseed Meal	3 do.

Form with soap.

Give a ball of this kind night and morning, until the fever and irritation are abated. Or,

No. 2.

Cape Aloes	1 drachm.
White Hellebore	1½ do.
Linseed Meal	3 do.

Form into a ball, and give as the first. By this means the irritation will be allayed, the fever abate, and the beating of the pulse become less rapid.

When the wound is more extensive, or more irregular, sutures should be employed with the pleget of tow, as before described. The part should be well bandaged, and every means taken to keep the horse as still as possible. Use a neck-cradle, lest, from the irritation, he may be inclined to gnaw the part affected. If these appliances have not the desired effect, recourse must be had to the actual cautery; and, if the opening is not too large, the budding-iron, of as good a shape as can be used, must be brought into operation, and the edges lightly touched with it. If the wound should be large and irregular, use a firing-iron carefully. These means have succeeded when all others have failed. Let the iron be heated to a dull red heat, which will be quite sufficient; and care must be taken not to insinuate it too far, otherwise considerable inflammation may follow. A stoppage of the synovia will show when the cautery has been sufficiently applied, when a pleget of tow must be put over it, and a poultice of bran, wetted frequently with the following:—

Sal-ammoniac, powdered	4 oz.
Sugar of Lead	1 do.
Vinegar	3 pints.
Water	1 do.

If the oozing of the synovia recommences, apply the iron again; and, as often as the oozing appears, repeat it, by which success may eventually be calculated on. In some aggravated cases blisters have been immediately applied with good effect. Bowels are sometimes employed as near the part as convenient,

but there is little faith to be put in them. Give bran mashes, or half bran and oats made damp: if there is much difficulty in administering the fever-balls, give of

Glauber Salts	4 oz.
Linseed Meal	2 do.
Hot Water	1 quart.

Mix well together for a drink, and repeat it morning and night. In mixing the meal with the above, do so first in a basin with a little *cold water*, to prevent its clotting together.

WOUNDS OF THE SHEATHS OF TENDONS.

This sort of wounds frequently occur both in the hind and fore legs, during hunting, staking, and the stubbing-in of coppices. They are also sometimes produced by the stable-fork, and are often attended with considerable pain. Their treatment differs in no respect whatever from that laid down in the description of wounds of the joints.

WOUNDS OF THE ARTERIES.

Every one who pretends to deal with the wounds of a horse, should have an intimate knowledge of the course of the arteries, so that in performing operations he may avoid wounding them. For stopping the flow of blood there are several methods; and unless they are performed with perfect coolness, they are apt to be done in such a manner as may be the cause of proving fatal to the patient. How necessary, therefore, is it that every practitioner should have a thorough acquaintance with the arterial system. Bleeding from arteries is stopped generally by *compression* and *astringents*, by *ligatures*, by the *actual and potential cautery;* sometimes by *styptics;* and not unfrequently, if the artery be only wounded, by dividing it altogether.

It must be plain to every one who understands the course of the circulation, that pressure made on that part of a wounded artery which adjoins the wound nearest the heart, must check the effusion of blood. The current of blood in the veins, running in the opposite direction, requires the pressure to be applied to that side of the wound which is most remote from the heart; and as pressure is the best means of impeding hæmorrhage, so is it the most effectual. The ligature, the application of a roller and compressers, only become useful in the suppression of hæmorrhage on the principle of pressure; the cautery-caustics and stypties are otherwise applied.

The different things that have been praised as infallible, in their application to wounded arteries, would seldom or ever have succeeded without compression. This was always requisite, even in the using of caustics, which were bound on with sufficient tightness to resist the impulse of the blood in the artery and the premature separation of the eschar, occasioned by the actual or potential cautery.

When the blood does not issue from any particular vessel, but from numerous small ones, compression is preferable to the ligature. The employment of the latter renders it necessary to tie the whole surface of the wound. The sides of the wound should be brought accurately together, compressers placed over the part, and a roller applied with sufficient tightness to make effectual pressure, but not so forcibly as to produce a danger of the circulation being completely stopped. If compression can ever safely be trusted in bleedings from large arteries, it is when these vessels lie immediately over a bone, against which they can be advantageously compressed.

The *ligature*, being well known to be a safe and easy means of stopping hæmorrhage, is attended with much less pain than former methods. It may, indeed, be set down as a rule, that where large arteries are wounded, no styptic application whatever should be trusted; but immediate recourse should be had to the ligature, as being, when properly applied, the most simple and safe of all methods. In explaining the action of the ligature, when applied round an artery, without including the surrounding parts, we have found the internal coat of the vessel is torn through by it. If the ligature is tied round with sufficient tightness, it will cut through the inner and middle coats; and although it is immediately removed, the vessels always become permanently impervious at the part which was tied as far as the first collateral branches, above and below the obstructed parts. This division of the internal and middle coats of the artery, produces an obstruction to the circulation of blood through its canal.

There must be a small quantity of stagnant blood, just within the extremity of the artery; but this does not, in every instance, immediately form a coagulum capable of filling up the canal of the artery. In most cases, only a slender coagulum is formed at first, which gradually becomes larger by successive additions. This coagulum is always at first of a tapering form, with its base at the extremity of the artery. But its formation is not material; for, soon after the ligature has been applied, the end of the artery inflames, and the wounded internal surface of its canal being kept in close contact by the ligature, adheres, and converts this portion of the artery into an impervious, and, at first, conical sac. It is to the effused lymph, that the base of the coagulum adheres, when found to be adherent. Lymph is also effused between the coats of the artery, and among the parts surrounding its extremity. In a little time the ligature makes the part, on which it is directly applied, ulcerate, and, acting as a tent, a small aperture is formed in the layer of lymph effused over the artery. Through this aperture, as long as the ligature remains, a small quantity of pus is discharged; and finally, the ligature itself escapes, and the little cavity, which it has occasioned, granulates, and fills up. The external wound then heals, leaving the cellular substance, a little beyond the end of the artery, somewhat thickened and indurated; but, if it should be in a situation where a bandage can be applied, it ultimately becomes absorbed.

As all *styptics* are not to be depended on, the judicious practitioner will seldom apply them, as they generally tend to irritate, and rarely do good. They are sometimes, however, proper to be applied to diseased surfaces, where the vessels seem to have lost their natural power, or disposition to contract or draw themselves together again.

Firing, or the *actual cautery*, is an excellent styptic to stop the bleeding of an artery, as in docking, castration, &c. It is generally resorted to as the safest styptic in operations of fistulous withers, and in dissecting out fungus flesh, where there is a number of small arteries which are apt to be wounded. The actual cautery is the only means that here can be employed with any good effect. In these cases the horse's body should be kept open with alterative medicines; such as the following:—

Cape Aloes	2 drachms.
Sulphur	3 do.

Form into a ball with soft soap.

Give one occasionally, and feed with half bran and half oats made damp.

WOUNDS OF THE VEINS.

Wounds of the veins are generally produced by incautiousness in blood-letting; and although this operation is performed by some of the greatest bunglers that possibly could take a phleme and blood-stick in hand, yet it is frequently so dexterously done, that no evil effects spring from it. Still, it does happen even with the most experienced practitioner, either from inattention in pinning up the orifice, drawing the skin a considerable way out, or not adjusting the lip of the wound equally together, that blood becomes extravasated into the surrounding cellular membrane. This, however, may sometimes arise from the foul constitution of the horse, when every little scratch or wound has a tendency to inflame and suppurate. Where this is the case, apply the following:—

Sal-ammoniac	1 oz.
Extract of Saturn	½ do.
Vinegar	1 pint.
Water	1 do.

Shake these well together in a bottle, and apply frequently during the day. If absorption takes place, and the parts regain their former appearance, all is well; but if the tumour suppurates, and on pressing the part a fluctuation is felt, a depending opening should be made, or a seton introduced through it. If inflammation should rise from the vein itself, it must spring from the use of rusty or unclean phlemes; but the probability is, that it has been punctured through, in consequence of driving the phleme with too great violence in the act of bleeding. It also sometimes arises from the horse being suffered to have his head at liberty immediately after bleeding, instead of being tied up for at least two or three hours; the pin causing irritation, the horse is inclined to rub against anything that is in his way, such as the edge of the manger, &c. Sometimes this morbid action arises from the constitution. When this is the case, it begins

to make its appearance in about two or three days after the operation of blood-letting, by a small tumour at the situation of the orifice, the lips of which unclose and look red, with a sort of ichorous discharge, sometimes accompanied with blood. In this case, if the progress is not stopped, the tumefaction extends along the course of the vein towards the head; the vessel becomes hard, and the blood contained in the trunk, forms into a firm coagulum, by which it becomes impervious, and all attempts to save it afterwards prove a failure. Suppuration of the tumour now begins to makes its appearance; but this is not always the case in the immediate part where the original puncture took place; abscesses will form in various situations above. If not taken in time, the morbid action will extend upwards so as to involve the side of the head as well as the neck in the disease; and when this occurs, it greatly interferes with the horse's eating and drinking. In such instances symptomatic fever is apt to run high, and, from the excess of irritability brought on, the animal frequently becomes a victim.

The treatment for inflammation of this sort is altogether difficult, and frequently doubtful. It has been by some writers thought, that in the early stage of the disease, the better plan is to close the venial orifice, which is to be done by the use of the budding-iron, applied to its outer edge. But this, by others, has not been approved; for if sloughing of the part is caused, it will not remove the main disease. It may, however, have a tendency to heal the orifice without having any connexion with the vein, where the disease may be going on all the time, to a very considerable extent. It is also said, that the ichorous oozing once being stopped, the vein will become in all respects as it was at first. This, however, has been either questioned, or wholly denied; for if the vein once takes on inflammation, its obliteration is certain to follow. Nor is this of so much danger as many persons would have us believe. Still, in such cases, the head of the horse should be kept tied up, so that he may have as little motion as possible.

The treatment adopted in such cases, and pursued with most success, has been, instead of using the cautery, to heal up the original wound—to keep that wound open, then introduce a probe as far as possible, up the course of the vein towards the head. When this has been done, the operator should feel down upon the end of the probe with his finger, cut down on the course of the vein about an inch above the end of the probe, and apply a ligature firmly. The probe-pointed bistory should then be taken, and a slit made up the length of the vein, which may be obliterated. Let this wound be well washed with warm water, and a suture or two applied, and a piece of tow or tape dressed with digestive ointment, until suppuration takes place. After this, in all probability, the sutures will come away, when dressing as for a common wound, with compound tincture of myrrh, should be begun. If abscesses or sinuses have become formed, the best method of treatment to be adopted is to introduce setons, so that the matter formed may escape by a depending orifice. Sometimes these sinuses assume an indolent manner, and become very troublesome. Where this happens, inject them with a solution of sulphate of zinc, which will generally be found sufficiently strong to answer all purposes. For this injection take of:

Sulphate of Zinc	1 oz.
Water	4 do.

Let the water be warm, and dissolve the sulphate of zinc in it. This injected into the sinuses will be found of great service, and less irritable than corrosive sublimate, copperas, &c. During the application of the foregoing remedies, give the following:—

Blue Pill	8 drachms.
Cape Aloes	8 do.
Resin	8 do.

Form into a mass with linseed meal and soft soap. Divide into six balls, and give one every second morning, first thing on going to stable.

It sometimes happens that the plate and thigh vein becomes inflamed, in consequence of the phleme being driven in too far, and puncturing the facia and parts underneath the vein. Should this be the case, the best application is, to bathe well with hot water five or six times a day, and make up a ball of the following ingredients:—

Cape Aloes	4 drachms.
Resin	2 do.

Form with soft soap,

and give one every second day.

BROKEN KNEES.

Horses, in the act of falling, endeavour, as much as possible, to save their head from coming in contact with the ground; but if not able in time to put forth their fore leg to do this, the knees generally become the sufferers, and, in some cases, to a very considerable extent. In such accidents, great laceration, open joint, and, at least, shaving, as it were, the hair completely off the knee to a greater or less extent generally occur.

Should the cavity of the knee be opened, and *joint oil* escape, sufficient instructions as to the proper method of treatment to be adopted, have been given in the article *Wounds of the Joints*, to which we beg to refer. But when the laceration only extends to the skin, there is only one safe, and, we should say, proper mode of treatment. In the first place, all irritating applications are to be avoided; and, instead of them, the knee and surrounding parts should be well bathed with hot water for at least half-an-hour. A poultice, composed of linseed meal and warm water, should then be applied, and continued until the inflammation is subdued. After this, apply the following:—

Extract of Saturn	2 drachms.
Tincture of Myrrh, compound .	2 oz.
Water	3 do.

Apply this to the wounded knees, until they are skinned over; then put on a mild blister, which will prevent, in many bad cases, even the appearance of a scar, if well managed.

This being accomplished, the next thing is to promote the growth of the hair. Many recipes are given to make the hair grow, but most of them are useless; for nothing acts specifically in this way. Whatever gently stimulates the skin being the most proper for this purpose, use every day a little of the digestive ointment, which is an article no stable ought to be without; or use the following, especially if the knees are black:—

Digestive Ointment	1 oz.
Gunpowder, rubbed fine . . .	1 drachm.

Mix, and rub the part with some of it daily.

GUN-SHOT WOUNDS.

Gun-shot wounds are made by hard bodies violently projected from cannons, muskets, and other fire-arms. Those from the rifle, however, occasion by far the greater number. They are the most considerable of the contused kind of wounds; and what is to be said of them, will apply, more or less, to all contused wounds, according to kind and degree. Daily observation shows that balls which obliquely strike a surface, do not penetrate it, but are reflected, although they may be impelled with the greatest force, and although the body struck may be as soft and yielding as water. This alteration in the course of the ball, not only occasionally happens on touching the surface of a body, but also sometimes after it has penetrated its substance. A bone or a tendon may change the direction of a ball, if it touches them obliquely. Hence it is manifest how it happens that the track of a gun-shot wound is not always straight, and how the balls sometimes run under the integument for a considerable distance, both in the body and the limbs.

A ball, when it strikes a part of the body, may cause four kinds of injury. *First*, it may only occasion a contusion, without penetrating the part, on account of its being too much spent, or on account of the oblique way in which it has struck the surface of the body. *Secondly*, it may enter and lodge immediately under the surface of a part, in which case, the track of the wound has only one aperture. *Thirdly*, it may pierce through and through; and then there are two openings, one at the entrance, and the other at the exit of the ball. In such cases, the circumference of the aperture, where the shot has entered, is usually depressed; that of the opening whence it escaped is elevated. At the entrance, there is commonly more contusion than at the exit of the ball; and the former is generally narrower; the latter wider, and more irregular, especially when the round smooth figure of the ball has been changed by its having struck a bone. *Fourthly*, a cannon-ball may tear off a whole limb.

Gun-shot wounds differ very much, according to the kind of body projected, its velocity, and the nature and peculiarities of the parts struck by it. The projected bodies are mostly bullets, sometimes cannon-balls. From the contusion which the parts suffer on the violent passage of the ball through them, there is most com-

monly a part of the solids surrounding the wound, deadened, which is afterwards thrown off in the form of slough, and which prevents such wounds from healing so readily at first, and makes most of them suppurate. This does not take place equally in every gun-shot wound, nor in every part of the same wound; and the difference commonly arises from the variety in the velocity of the body projected; for, where the ball has passed with little velocity, which is sometimes the case at its entrance, but still more frequently at the part last wounded, the injury may often be healed by the first intention.

Foreign bodies are more frequently met with in gun-shot wounds than any others, and are commonly of three kinds. *First*, pieces of clothing, leather, part of a girth, or other things which the ball may have forced before it. *Secondly*, the ball itself. *Thirdly*, loose splinters of bone. It is only when the ball strikes a naked part, does not touch a bone, but goes through and through, that the wound can be free from extraneous matter. Foreign bodies are the cause of numerous unfavourable symptoms, by irritating sensitive parts, and exciting pain, inflammation, hæmorrhage, and long suppurations. They are more productive of such evils, the more uneven, pointed, and hard they are. Hence spiculæ of bone are always most to be dreaded.

When a ball strikes a bone, the concussion produced is another occasion of bad symptoms to be added to those already mentioned. When slight, its effects are confined to the part injured. Sometimes they extend to the neighbouring joints, in which they produce considerable inflammation, frequently abscesses, and, in many cases, stiff joint, rendering the animal ever afterwards useless.

From the circumstance of the inner surface of gun-shot wounds being more or less deadened, they are late in inflaming. But when a ball has fractured a bone, and caused great injury to the softer parts, independently of what has been caused immediately by the ball itself, the inflammation will probably rapidly come on, because the deadened parts will bear no proportion to the laceration, or wound in general.

When the ball moves with little velocity, the mischief is generally less; the bones are not so likely to be fractured, and the parts are less deadened. However, when the velocity is just enough to splinter a bone which is touched, the splintering is generally more extensive than if the impetus of the ball had been much greater, which would rather have taken a piece out. When the ball moves slowly, it is more likely to be turned by any resistance it may encounter in its passage through parts; and hence the wound is more likely to take a winding course. When a ball enters a part with great velocity, but is almost spent when it comes out again, in consequence of the resistance it has met with, there may be a great deal of sloughing about the entrance of the wound, and little or none about the exit, owing to the different degrees of celerity with which the projectile has traversed the parts.

As the ends of the torn vessels are contused and compressed, gun-shot wounds have little tendency to bleed much; and unless very considerable vessels are lacerated, they do not bleed at all: sometimes not in this case. The greatest danger of bleeding is always when the dead parts are detached eight or ten days after the injury. Angular, uneven bodies, such as pieces of iron, cut lead, &c., always occasion far more dangerous wounds than round even bodies, like leaden bullets. Wounds occasioned by small, are frequently more perilous than others produced by larger balls, because their track is so narrow that it cannot be traced, nor the extraneous body itself so easily extracted. Such a shot oftentimes injures a viscera, when there is not the smallest external symptom of this being the case. Sometimes a great part of the danger arises from the number of shots which have entered.

In treating for gun-shot wounds, the first thing to be done is to ascertain, if possible, their extent; which is, at all times, best done with the finger, in preference to a probe. Besides, in extracting the ball, or any foreign piece of matter, which ought always, at once, to be extracted, the finger will act as a director. If extraneous substances remaining in the wound, either loosen gradually, and come into view, they may be easily removed; but if they be easily removable, or continue concealed, they may prevent the cure, and frequently give birth to a fistulous ulcer. In

some instances foreign bodies remain in during life, without inconvenience; and, in other cases, after a time they bring on a renewal of inflammation and suppuration. Sometimes a foreign body changes its situation, and afterwards makes its appearance at a part altogether away from its original seat, where it may excite inflammation and suppuration.

When the ball lodges in the wound, it is often difficult to trace it, as the parts collapse after its passage; and as it does not regularly take a straight direction through the injured part, but oftentimes a very tortuous one, which is more apt to occur as the ball is more spent. In every case in which it is not easily discoverable, all painful examinations should be abandoned, and the foreign body left in its situation, where it rarely creates any trouble.

Sometimes the ball may be both easily found and extracted. If the integuments under which it is lodged, should be so contused that they will probably slough, they are to be considered as already dead; and an opening is to be made in them for the extraction of the ball. But when the ball lies so remotely from the skin that it can only just be felt, and the skin itself is quite uninjured, no counter-opening ought to be made. The wound will heal better with the ball left in, and far less inflammation take place in the vicinity of this extraneous body, than about the orifice of the wound. A counter-opening always renders the inflammation at the bottom of the wound as great as at its orifice. It is better to let the wound heal up, and extract the ball afterwards.

As a certain portion of the parts surrounding the orifice made by the ball, becomes bruised, sloughing must be expected, as it is the operation of separating the bruised or dead bodies from the living. In some cases this takes a little time, when it should be hastened on, by applications such as the following:—

Oil of Turpentine	3 oz.
Olive Oil	3 do.

Shake well together in a bottle, and rub some on, for a distance of six inches all round the wound. This will stimulate it to put on the suppurative process. Apply a tent in the wound, smeared over with the common digestive ointment. When the suppurative process appears too great, desist from applying the liniment, and use, instead, the following lotion:—

Alum	1 oz.
Sulphate of Zinc	2 drachms.
Water	1 pint.

Dissolve the alum and zinc in the water.

Apply this two or three times in the day. The horse should be supported well; for, in general, these cases come at a time when provender is short, as in time of warfare, &c. Bleeding in gun-shot wounds is not to be recommended, unless symptomatic fever should run high; and even then it should be done with caution; for it frequently happens, when the sloughing takes place, the wound bleeds rather more than is to be desired. In such cases use an astringent lotion. As before stated, keep the horse well, or disappointment in all the treatment may in a great measure be the result. Give the following every morning:—

Sulphate of Iron	10 drachms.
Ginger	12 do.
Gentian	12 do.
Linseed Meal	6 do.

Form into a mass with soft soap.

SUTURES.

In the treatment of wounds, sutures have been frequently mentioned. It may therefore not be improper to name those principally in use, and the method of applying them.

A suture, in surgery, means a mode of uniting the edges of a wound, by keeping them in contact with stitches.

The Interrupted Suture.—The wound being cleansed of all clots of blood, and its lips brought evenly into contact, a curved needle, armed with a ligature of thread doubled, or good twine, is to be taken, and carefully passed from without, inwards to the bottom, and so on from within outwards. Care must be taken to make the puncture far enough from the edge of the wound, lest the ligature should tear quite through the skin and flesh. The other stitches are only repetitions of the same process. The threads having been all passed, generally begin to tie them in the middle of the wound; though if the lips of the part be carefully held together by an assistant, it will not be of great consequence which stitch is tied first. The

common rule is, that one suture is sufficient for every inch of the wound; but in some instances a stitch must be more frequently made than this, particularly when a wound gapes very much, in consequence of a transverse division of muscles. It is necessary to pierce the skin at a sufficient distance from the sides of the wound, lest the thread should cut through the flesh in a short time; the distance should be about three or four-tenths of an inch. When a wound is very deep, it would be wrong, and even, in many instances, dangerous to drive the needle through a vast thickness of parts. Other wounds, of considerable length, might not be in some places four-tenths of an inch deep, though it is true, sutures—the interrupted one at least—can never be requisite at such points.

The interrupted suture obviously receives its name from the interspaces between the stitches; and it is the one most frequently employed. Its action is always to be assisted and supported, either by a bandage, if the wound is in the limbs. If in other situations, by adhesive plaister, &c.

The Glover's Suture. This had also the name of the *continued suture.* It was executed by introducing the needle first into one lip of the wound from within outwards, then into the other the same way, and in this manner the whole track of the wound was sewed up. But the glover's suture is now almost fallen into desuetude, as improper to be employed in cases of common wounds. When it is remembered in making this suture, how many stitches are unavoidable, how unevenly they are made, and in what a puckered state the suture drags the edges of the skin together, and what irritation it produces, we can no longer be surprised at its now being never practised.

The Twisted Suture is not very applicable to the horse, though by some writers it is recommended for certain wounds, as the eyelids, lips, nostrils, &c. It may be advantageous in some cases, but the *interrupted* has been preferred to all others, and on all occasions.

CHAPTER XVII.

ULCERS.—ULCERS IN GENERAL; POLL-EVIL; FISTULOUS WITHERS; ULCERS IN THE MOUTH; STRANGLES; VINES.

ULCERS IN GENERAL.

ULCERATION is the result of a certain process which sores sometimes undergo in animal bodies. In this process the lymphatics appear to be, at least, as active as the blood-vessels. An ulcer may be defined as a chasm formed on the surface of the body by the action of the absorbents in removing parts back into the system. Or, in other words, it consists of the absorption or removal of substance. It is a useful process of nature, though very usually a troublesome disease. At first, it may be difficult to conceive how a part of the body can be removed by itself; but there is not more difficulty in conceiving this, than how a body can form itself. Both facts are equally well confirmed. When it becomes necessary that some whole living part should be removed, nature effects the object by conferring a new activity on the absorbents, and by throwing the part to be absorbed into a state which yields to this operation. The absorption of whole parts in disease, arises from several causes, but those we have principally to contend with, either arise from the parts becoming bruised, or from constitutional irritability.

Ulceration, or, in other words, absorption, takes place much more readily in the cellular and adipose substance, than in muscles, tendons, nerves, and blood-vessels. Hence, in the progress of pus to the skin or surface of the body, ulceration often takes a circuitous course. The skin itself being highly organ-

ised, considerably retards the bursting of abscesses, so that when ulceration is spreading, the edges of the skin hang over the ulcerated part.

When the disease takes place, in consequence of the death of an external part, it occurs first on the outer edge, between the dead and living substance.

Abscesses constantly make their way to the surface of the body by ulceration.

The parts which are situated between an abscess, or any extraneous substance, and the nearest surface, are those which are most susceptible of the disease. This is one of the most curious phenomena connected with the process under consideration. It shows that there is a principle in the system, by which parts are always prone to free themselves from painful or disagreeable affections. Slight pressure from without will even produce a thickening of parts, such as pressure from the saddle, the harness, &c.; but, though this may occur, still there appears to be a corresponding backwardness to admit disease.

There is one difference between the advancement of an encysted tumour, to the surface of the body, and the progress of an abscess in the same direction, viz., that the former does not excite ulceration of the cyst, but an interstitial absorption of the sound parts, between the cyst and the skin, till the cyst and the external skin come into contact. When this has occurred, inflammation takes place, and absorption becomes accelerated into ulceration. In an abscess, the progressive ulceration begins in the cyst, at the same time that the interstitial absorption, in the second part covering the matter, is going on. The action of progressive absorption is to remove surfaces contiguous to irritating causes, as in the case of tumours, pressure becomes a cause.

That pressure is a frequent cause of ulceration, is daily proved by the effects of harness and other parts of the furniture of horses.

That irritating substances produce ulceration, needs no illustration.

Progressive absorption may occur, either with or without suppuration. We have instances of the latter, in cases of extraneous bodies which travel about the system without producing irritation enough to give rise to the secretion of pus.

Absorption, with suppuration, in other words ulceration, either happens in consequence of suppuration already begun, in which event the pus acts as a pressure, or when absorption attacks external surfaces from particular irritations or weakness, in which suppuration must follow.

The principal ulcerations to which the horse is most liable are poll-evil, fistulous withers, ulcers of the mouth, and strangles.

POLL-EVIL.

This, of all ulcers, in the horse, is the most troublesome to deal with; for, though the veterinary surgeon may complete a cure, the time and expense incurred, neither remunerate him for his applications and trouble, nor do they gain him any credit as a professional man. In this disease, the old farriers went violently to work with all the scalding materials the druggist's shop could supply; but the milder system adopted by the modern veterinary practitioner, has, in a great measure, done away with their unskilful and unsurgical modes of treatment. Still it happens, unfortunately, that this disease is not generally brought under the notice of the veterinarian until the village farrier has expended all his recipes and knowledge; and after all this it is more than ten-to-one, if he has really discovered the part that is affected. We will therefore endeavour to point out the nature and real situation of poll-evil.

Poll-evil is an unhealthy inflammation, which takes place at the back of the ears from blows or bruises, or other injuries which the horse may have sustaind on that part. It is frequently found in farm or cart-horses, which are sometimes cursed with evil-disposed carters who, in a passion, will strike them about the head with the butt-end of their whips, or whatever they may chance to have in their hand. We have seen a horse knocked down senseless, with comparatively a slight blow at the back of the ear. Now, there is a mucous capsule at the conjunction of the head with the first bone of the neck, over which passes the *ligamentum colii*, or as the farriers term it, the *pax-fax* of the neck. These parts, from blows or other injuries, contract inflammation, and hence an ill-conditioned ulcer is formed; and from its situation being near the head or knowl, it is called poll-evil. Chestnut horses are

more susceptible of it than horses of any other colour: at least such has been observed to be the case; and it is attributed to the delicacy of constitution in light chestnut animals, more than to anything else. There is scarcely a case of poll-evil that, either directly or indirectly, arises from constitutional disposition. Hay-seeds about the head may induce the horse to rub, and, in consequence, produce irritation; dragging back in the halter may occasion bruises, and both of these actions may produce ulceration.

Poll-evil, when first discovered, will frequently yield to repellent applications, of which the following may be tried—

Sal-ammoniac	4 oz.
Sugar of Lead	1 do.
Vinegar	1 pint.

Apply this lotion constantly to the poll of the head, by keeping cloths on continually wet. In applying the cloth, have it sufficiently large, to allow two holes to be cut in it, so that it may be passed easily over the horse's ears, by which means it will be retained in its place. This cloth can easily be renewed, or with a sponge apply more of the lotion; in the meantime feed on bran mashes, and give—

Cape Aloes	6 drachms.
Juniper Berries	2 do.

Form with soft soap.

Let a ball, composed of these ingredients be given twice a-week.

Should the tumour appear stationary, and the process of absorption not likely to commence, great benefit has been found from applying a liquid blister, composed of—

Cantharides	1 oz.
Vinegar	3 do.
Spirits of Wine	1 do.

Put these together, in a bottle, and frequently shake it. In eight or ten days it will be fit for use. Rub about two table-spoonfuls on the tumour night and morning.

When all hopes of preventing an abscess have ceased, it must then be promoted, by stimulating the skin, and instead of poultices or applications of warm water, the following should be applied—

Oil of Turpentine	2 oz.
Oil of Olives	2 do.

Rub this well into the swelling, night and morning, until on pressure under the finger and thumb, it is found to fluctuate. When the maturation is perfect, which may be known by the soft feel of the tumour, the next thing to be taken into consideration is, to effect the evacuation of the contained matter, at the most depending situation, to prevent the formation of sinuses. Nothing is so good in this case as introducing setons on both sides of the neck. Should these act well, a speedy cure may be anticipated. But when from improper management, matter has not only formed, but has been suffered to remain, or has only evacuated itself by a superficial opening either natural or artificial, and not from one in a depending situation, whereby a re-accumulation of pus has taken place, the consequence is that the ligaments have taken on disease, which may have extended under the cervical ligament, leaving it hollow below. In such cases the healthy secretion always ceases, and instead of it a thin ichorous or glairy discharge is set up. This ichorous matter penetrates into the interstices of the muscles, when sinuses become formed in every direction, and if not speedily relieved, caries of the bones of the neck is the consequence. From this neglect, or bad treatment of the disease, horses may frequently be seen with what is called a stiff neck, poking their noses and heads out in the most disagreeable manner imaginable. To prevent these effects active measures should be taken. An experienced veterinary surgeon, who can handle the scalpel with dexterity and confidence, should, at once, be called in, and the horse immediately cast. When this has been done, a careful examination should be made with the probe and the finger, that the extent and direction of the sinuses may be ascertained. This should not be negligently or slightly done so as to have a doubt upon the mind, but with the utmost precision and certainty. As you have got the horse confined, and fairly under your command, the most critical examination must be made, for the cure will greatly depend upon this, and the horse, to a large extent, be relieved from unnecessary pain. In making this examination the finger will be found of much more service than the probe; therefore, carefully examine the ulcer with it, more especially, if caries should have taken place; for this must be dissected out before a cure can possibly be expected. Of these things the old

farriers knew nothing; consequently, if they could heal the external opening, they imagined they had accomplished a great feat; and hence the liability of the parts to become diseased again. Hard and callous edges must be removed, and the smaller sinuses laid open, so as to form a cavity. If all this is not thoroughly attended to, and done when the whole seems on the point of healing, a new tumour will suddenly arise as the result of the carious bone, or of some portion of ligament remaining in the abscess. In this case, the experienced veterinarian, who is expert with the knife, and fully acquainted with the anatomy of the parts, will not hesitate how to act. In the hands of the common farrier, much injury has frequently been done from the injudicious use of the knife. Even the cervical ligament has been known to be divided by ignorant pretenders, who having no character to lose, grope on in the dark for the paltry fee of a few shillings, sooner than acknowledge themselves in error. Instead, therefore, of hazarding any of these evils, the practitioner will be justified in this state of the case in introducing setons, even to the number of three or four on each side, going down to the bottom of each sinus, no matter how deep it may be. When this has been dexterously done, dress the setons with the following mild blister ointment, every day:—

Cantharides, powdered . .	2 drachms.
Hog's Lard	3 oz.

Continue this until the matter becomes of a good consistence. Where cases of great obstinacy occur, and this fails to produce a good effect, stronger means must be adopted. Therefore use the following:

Corrosive Sublimate . . .	2 drachms.
Water	2 oz.

Dissolve the sublimate in the water, and inject the sinuses with the mixture. If this does not produce any amendment, proceed to scalding, in order to overcome the morbid action, and produce a kind of inflammation, from which healthy granulations may follow. To obtain this try either of the following:

No. 1.

Arsenic, finely powdered . .	2 drachms.
Digestive Ointment . . .	4 oz.

No. 2.

Corrosive Sublimate . . .	1½ drachm.
Digestive Ointment . . .	4 oz.

No. 3.

Butter of Antimony . . .	3 drachms.
Oil of Turpentine	2 oz.

To render any of the above properly applicable melt either of them in an iron ladle to a scalding heat, and, as the horse lies on the ground, carefully pour the liquid into the wound, putting in, at the same time, a little tow. At the end of four or five days, sloughing will commence. After this apply digestive ointment, and treat as a common wound. If the wound should not be going on satisfactorily apply the scalding composition again. Splints externally applied by pressure, have been found of great benefit in the treatment of Poll-evil. In the fifth volume of the *Veterinarian*, Mr. A. Gray says, "A mare was sent to me, and I proceeded to examine the extent of the disease. I found two deep sinuses, one on each side of the neck, the bones of which could be distinctly felt with the probe. After cleaning away the matter I took a scalpel and laid both orifices open, in an oblique direction downwards; then, having fomented the parts with warm water, I dressed the wounds with tincture of myrrh and aloes; and, in order to apply pressure to the parts—for in this I founded all my hopes of success—I had two pieces of wood prepared, about twelve inches long and three broad; thicker in the middle than at the edges, which were rounded off, and also a long flannel bandage, four inches broad. I then placed two pledgets of tow next the wounds, putting on the pieces of wood, one on each side, and then applied the bandage over all, and as tightly as I could, without impeding deglutition. It is necessary while putting on the bandage, to keep the nose extended, in order to adapt the bandage more perfectly to the part, and apply it more closely. I removed the bandage, night and morning, and had the parts well fomented and dressed with the tincture. In the course of four weeks the mare was well."

FISTULOUS WITHERS.

This disease is, in general, the consequence of neglect, or the careless manner in which the saddle is fixed to the back of the horse. When it is too wide in the trees, the pressure, coming repeatedly on the withers with double force, the parts become bruised and pinched,

and inevitably begin to form matter. It is frequently the case that this is not taken notice of till the evil has been repeated, and bruise upon bruise inflicted, when inflammation and swelling ensue, threatening an unavoidable suppuration. This culpable neglect is sometimes followed by error, for, during the time that the process of nature is going on, and the matter in the tumour forming, the repellent lotion, as prescribed for poll-evil is generally used. Here now begins a terrible struggle between the powers of nature and art; for these applications failing in repelling, or dispersing the contents, have their properties distributed over the integuments, where, by repeated application, an induration is produced very unfavourable to the abscess in its more advanced state. Nature, at last, becomes predominant, and effects her purpose. The tumour suppurates, and, as a consequence, a discharge comes on, but without one of those advantages that would have been acquired had the efforts of nature been attended to and properly encouraged, instead of being opposed.

This is the origin and progress of what constitutes a confirmed fistula, which falls under the very method of cure described in the case of poll-evil. It should be remembered that all sinuses or cavities into which the probe can be passed should be laid open, taking care to make no transverse opening across the withers, and to avoid dividing the long ligament. Care should be taken to make the incisions on each side, or on both sides, in a longitudinal direction, if it should be required. Should the discharge not assume a healthy appearance, a preparation of the following proportions should be made:

Digestive Ointment	2 oz.
Red Precipitate	2 drachms.

Form into an ointment, and apply every morning to the wound, until the discharge becomes more healthy. Should this application be successful, in obtaining a healthy discharge of pus, try the following, in order to heal the wound as soon as possible:

Vinegar	2 oz.
Compound Tincture of Myrrh .	1 do.
Tincture of Cantharides . . .	1 do.

Inject this mixture to the bottom of the wound two or three times a day, and it will produce a healthy secretion of pus, and promote the healing process. If the lotion is not used, it may be as well to warm the precipitate ointment in an iron ladle, and pour some of it into the wound, so that it may penetrate every sinus that has been formed.

Incisions or scarifications should be made whenever necessary, and all callous, hardened parts dissected out, and, if required, two or three setons passed in the most depending situations. This method should be pursued in preference to any other, unless the wound has been suffered to proceed some considerable time, and a vast formation of proud or fungus flesh allowed to be formed. Then the knife becomes the only remedy. This mode of treatment should have the preference on all occasions; consequently, if the milder method should not succeed in restoring the parts, then the scalding method, as prescribed in poll-evil should be resorted to.

Let it be borne in mind, however, notwithstanding the recommendation of all these remedial measures, that this disease, when first discovered, may be completely removed by repellent applications, but, when bruise after bruise is suffered to go on, and matter to be formed, repellents do more harm than good. If none of the preceding applications should be at all successful, proceed to scalding, such as described under the heading of poll-evil.

If a clean sore can be obtained by cutting open the part freely, and if there are no sinuses, Professor Spooner recommends mild dressings or tents of digestive ointment, tincture of myrrh, &c. These, however, seldom effect a cure, therefore repeated dressings with caustic ointment, must generally be resorted to

ULCERS IN THE MOUTH.

Ulcers in the mouth sometimes proceed from the irritation of too severe a bit, or from some sympathetic inflammation, such as a ragged tooth, and frequently from constitutional irritation, when watery tumours, similar to gum-boils in the human subject, frequently appear. As a remedy for this, the following preparation is recommended to be applied to the sores three or four times a day:

Spirits of Wine	2 oz.
Vinegar	2 do.
Honey	1 do.
Alum, burnt	4 drachms.

Take a small stick, with some linen or tow tied to the end of it, and apply this as often as above directed. As all persons do not know the meaning of burnt alum, make it thus. Buy an ounce of common alum, put it in the fire-shovel, and set it on the fire, when the heat will evaporate the watery matter from the alum, leaving that which is burned, and which is technically called *alumen ustum.*

STRANGLES.

The apparent sensation of suffocation is the probable origin of the name of this disease, with which many horses are, at some period of their lives afflicted. Although subject to it at all times of life, the periods of attack are mostly when they are rising three or four years old. Horses, at that time of life, are generally taken in from grass, though colts at grass frequently become affected; but animals removed from grass to a warm stable, are much more liable to take the disease, which would lead to the inference that it is the heated atmosphere, combined with the stench of the dung and urine, which produces inflammation and suppuration of the submaxillary glands.

This is brought on, nine times out of ten, when the horse is brought into the stable, either to be broken into saddle or harness. In those cases where it takes place out of doors, poverty is the principal cause, producing extreme debility, and, most frequently, horses so attacked, and in so weak a state, generally, or at least most frequently, become victims to the disorder, and not unfrequently are affected with glanders.

The first attack generally commences with a dull sluggish heaviness and inactivity, the horse becoming dispirited, losing his appetite, having a hollow husky cough, occasioned by the irritability of the inflamed glands, and sore throat. To excite a degree of moisture in the mouth, with the view of allaying this disagreeable sensation, he is often picking his hay, but eating little or none. A degree of symptomatic fever comes on, and a consequent clamminess and thirst is perceptible; but the animal appears to have great difficulty in swallowing water. As the disease advances, he becomes proportionally languid and inattentive. Between the jaws there is an apparent swelling of the glands, which is, at first, very hard, exceedingly painful, and visibly increasing. He now swallows with great difficulty, heaves at the flanks, and his whole appearance urges the necessity of an immediate attempt to relieve nature.

For the treatment of this disease care must be taken not to bleed the animal, unless the febrile symptoms run very high, and then only in small quantities, as would be done in catarrhal affections; for the debility with which it is accompanied will not allow much blood to be taken from him. In almost any case, a couple of quarts should not be exceeded, unless there is much heaving at the flanks, and the pulse is hard and quickened, and the extremities cold. "Unless the symptoms of fever are particularly severe," says Professor Spooner, "and inflammation of the windpipe and lungs is threatened, it is better to avoid blood-letting; and if employed, it should be with moderation. The bowels should be moderately relaxed, for which purpose two or three drachms of aloes may be given in a ball; but rarely, if ever, repeated. Two drachms of nitre, and one of tartarised antimony, may be given twice a day in a mash. He should avoid drenching as much as possible, in consequence of the soreness of the throat. A stimulating liniment should be rubbed on the swelling, and a warm linseed meal poultice applied and changed twice a day."

Use a nose-bag, frequently replenished with hot water and bran, for the purpose of steaming the nostrils, and promoting a discharge. Should the tumours break inwardly, you will find this of great service. The next thing to be done is to promote the suppuration of the swelling as quickly as possible; but this must not be attempted by poultices. These have a tendency to do much more harm than good, unless there is a man constantly in attendance, for the moment the poultice becomes cold, it acts as a repellent to the tumours, and obviates what is wished to be produced. Take, therefore, of

Oil of Turpentine	3 oz.
Olive Oil	3 do.

Apply this liniment to the throat, and tumours between the jaws, three times a day, having first clipped off the hair close, to allow the liniment to act quickly. Should this not pro-

duce suppuration so speedily as anticipated, use the following:

Cantharides	2 drachms.
Oil of Turpentine . . .	2 oz.
Olive Oil	2 do.

Shake well together in a bottle, for two days, and apply as directed in the former.

Either of these applications will produce a speedy suppuration of the tumours, and on feeling them, they will be found to undulate; at this period the lancet may be introduced to let the matter out; but never lance the tumours unless there is a perfect certainty that matter has formed. If the tumour should break of itself, and the opening be small, enlarge it with the lancet. Have the parts now well fomented, and washed with warm water two or three times a day; always remembering to wipe them dry with a *linen cloth*. This being done, a hood should be placed on his head, with a piece of flannel to cover the jaws. When the discharge has terminated, and the orifices made with puncturing appear red and healthy, proceed to the healing process, which naturally of itself would take place; but it is necessary to assist nature. To do this, take

Sulphate of Zinc	1 drachm.
Vinegar	2 oz.
Watery solution of Aloes. . .	3 do.

Dissolve the sulphate in the acid, then add the solution of aloes.

Apply this mixture to the sores, morning and night.

For feed, any nourishing diet will be proper; but whatever this is, it must be given in small quantities. Try the horse with half bran and oats slightly wetted; and when he begins to swallow tolerably well, give him a little speared malt in his feed. This will rouse him from that debilitated state the disease has reduced him to; and to further strengthen his system give the following:

Cape Aloes	6 drachms.
Sulphate of Iron	6 do.
Gentian	12 do.
Linseed Meal	12 do.

Form into a mass with soft soap, and divide into six balls.

Administer one every second day.

There is a consolation in this disease that a symptom of danger occurs but seldom, and then principally when horses are affected by it at grass, and especially in consequence of their being *only colts*. At this time they are not brought under the eye of the master so often as they otherwise would be. But if the horse is kept in the stable, the danger generally occurs from neglect, or absolute cruelty, in riding or driving to extremity. When the disease has commenced, and gone so far as to produce fever, and then inflammation, it generally terminates in glanders; consequently the greatest care as to cleanliness is of the highest importance, such as sponging the nostrils well out every morning and evening; and he should be kept warm.

VIVES.

Vives is the name given to strangles, when the parotid gland alone is attacked. How the name arose we cannot now ascertain; but as the disease is generally known by that term, it would be folly to change it in a general work of this kind.

It consists of *an inflammation and enlargement of the parotid glands*, situated and commencing at the base of the ear, and continued down to the angle of the jaw. By old farriers it is called *bastard strangles;* but this is an error, for they never suppurate; but occasion great pain to the horse whilst eating, in consequence of the action of the jaw continually pressing on the enlarged gland.

These swellings at times become so fixed, that cough and considerable irritation are produced about the anterior part of the epiglottis, which covers the wind-pipe in the act of swallowing, to prevent food passing down that tube, and when food comes in contact with it, cough is almost sure to take place. In consequence of this, the irritation is frequently so great, that the horse will cough repeatedly, with such violence, that it would lead one to suppose that the rupture of some vital part must be the result.

In this disease, stimulants, in order to promote a discharge, should never be applied, lest there should be left a blemish, which will greatly lessen the value of the horse. The method found best in treating for it is to apply the following:—

Ammonia	1 oz.
Olive oil	4 do.

Rub about two table-spoonfuls of this liniment on each gland, morning and night, and take of

Cape aloes	6 drachms.
Ginger	1 „

Form into a ball with soap,

and give. If the horse's throat should be at all sore, giving a ball is always attended with difficulty; and should this be the case, take of

Glauber salts	4 oz.
Linseed meal	2 do.

Mix the linseed meal with a little cold water first in a basin, then take about a quart of hot water, and dissolve the salts. When this is done, mix altogether, and carefully horn it down. This must be repeated morning and night, until the swelling goes down, and the horse begins to feed better. Should the ball have been given, five or six days should be allowed to intervene before the dose is repeated.

Some animals are extremely awkward, either to give a draught, or to make take a ball. Should such be the case, take of

Sulphur	12 oz.
Glauber salts, finely powdered .	1 lb.

Well work together in a mortar,

and give one in the horse's feed morning and night.

For feed, bran mashes should be given cold; but if he should not take to these well, a handful of sweet oats should be mixed with them to entice him to eat. In all cases when sick horses are to be fed, the hands should be free from unpleasant smells, as the senses of the animal are so exceedingly delicate, that the least offensive smell will cause him to refuse all kinds of food, let his appetite be ever so good.

CHAPTER XVIII.

RHEUMATISM.—ANTICOR; LAMPAS; WARBLES; SITFAST; BRUISES; BARBS.

RHEUMATISM.

Rheumatism in horses has, in England, been little treated on; though the French have written considerably on it; and this, in all probability, was the cause of drawing the attention of the veterinarian to the subject.

The disease is characterised by fever, pains in the joints, increased by the action of the muscles belonging to the joint, the disease frequently flying from one joint to another, and this most frequently in young horses. In aged animals the back and loins become the parts principally affected; the horse going stiff, scarcely able to turn, and his legs moving under him more like jointless props than legs. It is frequently preceded by shivering, heat, thirst, and quickened pulse; and some persons, from these symptoms, are apt to think that inflammation of the lungs has taken place. However, the young surgeon must not be deceived by these appearances; for after the above symptoms the pain soon commences and fixes on the joints.

Rheumatism may occur by pain in the joints without fever, and this mostly with coach or hack horses, from being ridden or driven hard, until they perspire very much, and are afterwards allowed to stand in a draft of wind. It may arise also, at all times of the year, especially when there are frequent vicissitudes of weather, from heat to cold. Obstructed perspiration is the principal cause which produces rheumatism. We have an account of a horse affected with *sciatica*, a species of rheumatism, which he suddenly caught. The gentleman to whom he belonged, had been riding rather sharp in the month of March. On coming home, he turned the animal into the stable, his groom at the moment being otherwise employed. On the man going to see him, he immediately led the horse to a pond in the yard, to water. Consequently he received a

sudden chill from the water; and the wind being cold at the season of the year, added to the dilatory manner in which grooms work at their horses, an attack of *sciatica* was the result. This was shown by the horse first lifting one hind leg, then the other, and especially in wet weather and after strong exercise. In this case, the horse's urine was always thick and muddy, made in small quantities, and very frequently. This was a case of confirmed chronic rheumatism. The horse was purchased by a coach proprietor for little more than half his worth. He was worked for about five years, but never recovered, and ultimately died of inflammation of the lungs.

This disease most frequently attacks coach and hack-horses in the back and loins. For the treatment of such, abstract about three quarts of blood, according to size and constitution; and if the inflammatory symptoms are severe, give the following:—

Barbadoes Aloes, from	4 to 6 drachms.
Ginger	1 „
Digitalis	1 „

Form a ball with soft soap.

After the bowels are freely opened, take of

Oil Turpentine	2 oz.
Olive Oil	2 do.
Ammonia	4 drachms.

Apply some of this liniment to the spine, where the stiffness appears greatest, which will, in all probability, be across the loins. Should this not prove effectual, success in the treatment has often resulted from the introduction of setons, one on each side of the backbone, near the loins; dressing, at the same time, with digestive ointment. Before introducing these, cast the horse.

When this disease attacks young horses, it is generally in the *acute* form; but it is mostly unaccompanied with fever. Colts, about two or three years old, are mostly subject to it, and principally in the winter months, when they are at grass, and the pasture is bad, not containing any nourishment. Acute rheumatism arises as much from debility as any cause, the colt not being able to bear up against the inclemency of the weather. As soon as the lameness is discovered—for here the joints are the principal seat of disease, especially the fetlock joints—have him immediately housed; and should it arise from debility, he must not be bled; for the cold and wet generally are the causes, and he requires tonic medicines to rouse and strengthen his system. In the first place, therefore, take of—

Gentian, powdered . . .	12 drachms.
Anise-seed, do.	12 „
Liquorice, do.	12 „
Antimony, do.	1 lb.
Sulphur	12 oz.

Rub well together in a mortar, and divide into twelve packets. Give one night and morning in the feed of the horse. For food, give good hay, and half oats and bran, three times a day.

Apply flannel bandages to all the legs, round the fetlock and pasterns. This, in general, will remove the pain, after having rubbed in some of the foregoing liniment; but the joints must not be bathed, as, by so doing, the evaporation arising afterwards will produce cold, and consequent stiffness, leaving the matter worse than it was at first.

Some of the old farriers have termed this disease, *the flying lameness*, in consequence of its frequently going from one part to another; but we may remark, that should *The Modern System of Farriery* fall into the hands of agriculturists, &c., where the term has become familiar, they will then know how to detect and treat the disease

ANTICOR.

This is a disease of the chest or belly, being a species of tumour formed by the debile state of the absorbents; they, in consequence, not being able to perform their functions: hence a serous fluid becomes deposited in the cellular membrane, which greatly abounds in these parts; and the fluid running together to the most pendent part, forms the tumour called anticor, from its being against or near the chest, or the heart. The disease is not frequent in this country, but it is common on the continent. In treating for it, bleeding is not to be recommended; but give half bran and half oats made wet, for corn feeds, and plenty of good hay; then take of

Cape Aloes, ...	6 drachms.
Resin	6 „
Sulphate of Iron	10 „
Linseed Meal	4 „

Mix, and form into a mass with soft soap.

Administer one of these balls every morning. Put an ounce of nitre into the water of the horse every night.

LAMPAS.

This consists of an enlargement or tumefaction of the roof of the mouth or palate, and is particularly to be observed in young horses. In some cases the enlargement becomes so prominent, as to project below the teeth of the upper jaw. This generally occurs when the horse is changing his teeth, or the tusks making their appearance. Another cause is, when horses are first taken from grass—which is, of course, soft food—and then put into a stable on hay and oats, both being hard meat, which occasions the palate to enlarge and inflame. From this cause the horse is not only deprived of a great portion of the nutriment necessary to his support, but he becomes poor, weak, dejected, and altogether out of condition. Its origin has been attributed to the change which takes place on being taken from grass and put into warm stables. This, however, is not likely to be the case, for breeders of horses generally have their stables cool enough.

In treating for lampas, scarification has been recommended; but that operation has not been generally successful, although it has been recommended by many veterinary surgeons. This disease more frequently comes under the notice of the common farrier than that of the surgeon; and by its so doing, custom has established a useful and expeditious extirpation of it by the actual cautery (represented in our Plate of Instruments): and though no advocate for violent remedies where they can possibly be avoided, yet this is a cure so speedily effected by an expert operator, and the suffering to the animal is so very trifling, that when a comparison is drawn between the temporary inconvenience and the immediate advantage, no hesitation can be made respecting the operation.

When the operation has been performed, the horse should be allowed to wash his mouth out with clean water; and nothing should be applied to the wound, which will heal of itself in a few days. If an application is made, it will only increase the pain of the animal, and in a few seconds he will have it all licked off again.

WARBLES.

These are swellings or tumours formed on the sides or some part of the back, in consequence of the unequal pressure of the saddle. They may also arise either from the excessive heat and friction, or the edge of a narrow saddle-cloth coming directly under the seat of the rider, and not unfrequently from the girths being too short, and the buckles at either one side or the other being set below the saddle pannel. If the pressure is repeated, and the groom does not perceive it, the tumour will sometimes suppurate. A sore will be the consequence; and it will probably be somewhat troublesome for several weeks.

As soon as the tumours are perceived, and before matter is formed, the following repellent should be used several times in the course of the day, and applied to the tumour, with a piece of sponge:—

Sal-ammoniac	2 oz.
Sugar of Lead	½ do.
Vinegar	1 pint.
Water	1 do.

The horse must have perfect rest in a loose box or barn, and a saddle or anything irritating must be kept from him. If the tumour remains hard, and has no appearance of going away, it then becomes what is termed

A SITFAST.

For this there is only one certain and expeditious cure. All applications in the shape of blisters, liniments, &c., meant to soften the tumour, will avail nothing. Therefore, take a scalpel, and dissect the tumour completely out, and dress with common digestive ointment, in which has been rubbed down a little red precipitate. When this has brought the wound to a healthy appearance, treat it two or three times a day with compound tincture of myrrh.

If, in the first instance, warbles should break, wash and dress first with the ointment as above, and then heal with the tincture. In the meantime, let the saddle pannel be altered, that a recurrence of the accident may not happen.

BRUISES.

These consist of tumours, which are formed by external injuries, such as kicks from other

horses, or passionate grooms, on the legs and other parts of the body. If the bruise is slight, and even though lameness is the result, it frequently becomes reduced almost apparently of itself; but if the injury should be severe, the extravasated blood will then become a source of pain and irritation. In some cases the blood is thrown out instead of becoming absorbed; congulates, and, at length, becomes vascular, when the enlargement remains permanent.

The treatment of bruises varies according to circumstances. If the case is not too severe, take of

Camphor	1 oz.
Spirits of Wine	8 do.

Dissolve the camphor in the spirits, and rub on a portion every morning and night, or take

Brandy	4 oz.
Vinegar	4 do.

Mix, and apply as above. If the bruise is in such a situation as will admit of a bandage, never omit it—flannel is the best. If the tumour remains hard and unyielding to the above treatment, stimulate the absorbents by applying mercurial ointment, well rubbed in for three or four days; after which apply a blister. Should this not succeed, recourse must be had to firing.

BARBS.

These are small tumours situated under the tongue, and frequently the cause of much pain, so that the horse, without great difficulty, cannot masticate his food. They are easily seen on drawing the tongue on one side, where two little prominences make their appearance. They arise from an inflammatory action, existing in the salivary ducts, produced either from symptomatic or local fever, and are generally attended with a large flow of saliva. The farriers of former days used to recommend their being entirely removed, by nipping them off with a pair of scissors; but there is no necessity for this. The following treatment will do away with them. Take of

Alum	1 oz.
Water	4 do.

Dissolve, and apply with a bit of sponge, tied to the end of a stick, several times a day. Give the horse an ounce of nitre in his water, for about five or six mornings, and a reduction in the enlargement will soon be perceived; and by-and-by they will altogether disappear.

CHAPTER XIX.

STONE.—STONE IN THE INTESTINES; THE KIDNEYS; THE BLADDER.

STONE IN THE INTESTINES.

The horizontal situation of the body of the horse, and the nature of his food, render him particularly liable to concretions in the intestines, which generally take place in *the colon*, from a peculiar curvature which this has of doubling on itself. At this curve, stone is usually found.

Most of these concretes, however, are in their beginning composed of salubrious matter, which first collects around some accidental nucleus, as a nail, or stone. It also very frequently occurs amongst millers' horses, from a portion of the grinding-stones, by friction having become mixed with the food upon which horses are commonly fed. From frequent deposits of a portion of the alimentary contents coming in contact with the nucleus, layer upon layer becomes formed, until, in some cases, they are of an enormous size. These calculi, in many instances, are so dense and hard as to admit of a fine polish; while some are of a softer nature, and appear more like indurated dung, and will break easy. Hair balls have frequently been found in the intestines, especially in *neat cattle;* and are very troublesome, being the cause of great inconvenience.

Horses do not appear to suffer so much from calculi as might, at first, be expected; and then the disease only appears like an attack of gripes, caused by some obstructed dung in the intestine, giving pain. When the passage is rendered free, the pain immediately ceases. Calculi frequently, or always, however, bring on a fatal strangulation, and consequent inflammation. In such cases the horse usually falls a victim.

The cure of this malady is out of our power, and its prevention is little less so, unless we perceive the horse addicted to eat roots or lick up the earth, to which he is sometimes given. The only chance of prevention, then, is to give bran mashes for a day or two, until his dung becomes moist. If in regular work, let him resume his usual food.

STONE IN THE KIDNEYS.

Stones sometimes form in the kidneys, or in their cavities. In the horse they accumulate till they fill the whole of the cavity; and we have heard of a case, in which, from the inflammation produced thereby, the kidneys became totally absorbed, and a large tumour was formed in their place. This animal could with difficulty walk: he was accordingly ordered to be destroyed; and on opening him, it was found that the right kidney had become a complete stone.

STONE IN THE BLADDER.

Though this disease is not so frequent in the horse as in the human subject, still we have no doubt of its occurring more frequently than is generally supposed. This is made pretty evident at the yard of the knacker, for very many calculi are there found, after death, in the bladder. The symptoms of its presence are frequent inclination to make water, voided in small quantities, and accompanied with excessive pain. Sometimes a sudden stoppage of it takes place; and this is very frequently attended with extremely sharp spasmodic pains. The horse then walks wide behind, or appears loth to move along, and occasionally reels about, with a staggering gait. The remedy was discovered, and, we believe, first brought into practice, by Mr. Sewell. The presence of stone in the bladder is not very difficult to discover; for, if we examine the bladder, and introduce the hand up the rectum, and feel for the bladder, just beyond the bone called the pubis, there it will be met with. When this is the case, try whether there is any hard substance present. If so, it is stone in the bladder.

For the removal of the substance, introduce a long, well oiled whalebone staff up the *urethra*, until the end of it is felt just under the *anus;* then take a scalpel, and cut perpendicularly down upon it, and enlarge the opening to about an inch and a-half. Into this opening pass a long whalebone probe, or, as it is called, a sound; the end of which will be felt to strike against the stone. Being satisfied of this, withdraw the instrument, and introduce your forceps, for the purpose of extracting the stone. If the opening should not be large enough, take a concealed bistory, and cut up a little, as the horse is supposed to be lying on his back. Then endeavour to seize the stone, and withdraw it whole. Should this not be practicable, the stone must be taken hold of by degrees, and broken down by means of the forceps. Then withdraw the pieces, and empty them. Continue to do this until *perfectly satisfied* that the whole of the stone is removed. This being done, inject warm water into the bladder, which will give the horse great ease. He may now be allowed to get up, when, in all probability, some sediment and urine may escape from the wound for a day or two. This need not occasion any alarm; but continue to bathe the parts two or three times a day with warm water. After this time, the wound will close, the urine pass off in its natural channel, when the wound should be treated as a common one, by applying to it, twice a day, compound tincture of myrrh. Should the horse take on any appearance of fever, give him, in his feed, with half bran and oats, made slightly wet—

Antimony	12 oz.
Sulphur	12 do.
Digitalis	6 drachms.

Mix, and divide into twelve powders. Administer one in his feed every night.

With mares the operation is less difficult, as the parts may be dilated instead of being cut; but to them the use of a round-headed catheter, sufficiently large in the bore to allow the sound to pass through it, is recom-

mended. When this is introduced, and the urine drawn off, pass the sound down the catheter into the bladder. Having accomplished this, withdraw the catheter, and having satisfied yourself of the calculi being there, proceed as before directed for a horse.

This operation does not generally fail if conducted with sufficient care.

CHAPTER XX.

WORMS.—WORMS IN GENERAL; JAUNDICE, OR YELLOWS; DIARRHŒA, LOOSENESS, OR SCOURING; CRIB-BITING.

WORMS IN GENERAL.

When worms have secured a settlement in either the stomach or intestines of the horse, he becomes a prey to perpetual annoyance, till effectual methods are taken for their total extirpation.

There are three kinds of worms to which the horse is liable; first, the long white worm, very much resembling the common large earth-worm, but much longer and harder. At its middle it is about the size of a large swan-quill, and regularly tapers off to the ends. The length of these worms varies from six inches to twelve, and they generally occupy the small intestines, and are at times exceedingly troublesome, frequently occasioning gripes, and not unfrequently inflammation, by their excessive irritation.

Another kind of worm is the small thread or needle-worm, which is frequently found in all the intestines, but more particularly in the large. It has also been found in some of the blood-vessels, in the windpipe, and in the lungs. This worm occasions great disturbance in the system when it becomes numerous, but not to the same extent as the last named.

There is a third kind of worm, called bots, which comprises two species. For almost all we know of this worm, we are indebted to Mr. Bracey Clark. Its history is simply this:—A species of gad-fly, "the *sestrus equi*, is, in the latter part of the summer, exceedingly busy about the horse. It is observed to be darting, with great rapidity, towards the knees and sides of the animal. The females are depositing their eggs on the hair, and which adhere to it by means of a glutinous fluid, with which they are surrounded. In a few days the eggs are ready to be hatched, and the slightest application of warmth and moisture will liberate the little animals they contain. The horse, in licking himself, touches the egg; it bursts, and a small worm escapes, which adheres to the tongue, and is conveyed with the food into the stomach. There it clings to the cuticular portion of the stomach, by means of a hook on either side of its mouth; and its hold is so firm and so obstinate, that it must be broken before it can be detached. It remains there, feeding on the mucus of the stomach during the whole of the winter, and until the end of the ensuing spring; when, having attained a considerable size, and being destined to undergo a certain transformation, it disengages itself from the cuticular coat, is carried into the villous portion of the stomach with the food, passes out of it with the chyme, and is evacuated with the dung. The larva, or maggot, seeks shelter in the ground, and buries itself there; it contracts in size, and becomes a chrysalis, or grub, in which state it lies inactive for a few weeks; and then, bursting from its confinement, assumes the form of a fly. The female becoming impregnated, quickly deposits her eggs on those parts of the horse which he is most accustomed to lick, and thus the species is perpetuated."

A horse affected with worms will be known by a dry yellowish matter adhering to the fundament, and running two or three inches down below. This is merely the soft part of

the worm, which, in making its escape, irritates the sphincter muscle, and becomes crushed. This frequently occurs in cart-horses. Worms are also often to be detected in the dung, especially the *thread worm* and the *long white worm*. The long worm is too strong in itself to be crushed by the sphincter, and the thread worm is too small for any impression to be made on it. There are other symptoms which indicate the presence of worms in the horse. For example, they occasion irregular appetite; render the bowels at one time costive; and, as irritation arises, making them again loose, with an unhealthy secretion attached to the dung. When bots are prevalent, the animal is frequently rubbing his tail against the sides of the stall, or against a post, and betraying many symptoms of a restless uneasiness.

The long white worm is very hurtful. Horses affected with it may eat well, and appear hearty, but they do not thrive. They become hide-bound; and in consequence of the skin sympathising so much with the stomach, the coat stares, and feels rough. This worm is very frequently attended with a short dry cough; sometimes it produces gripes, with hot breath, which smells very disagreeable.

For the treatment of worms, there are but two articles that any reliance can at all be placed in, and that can lay claim to approbation; and one of these is calomel. Antimonials and preparations of tin have each their advocates, and so has train oil. A few of the products of the vegetable kingdom, in the opinion of some, are never-failing, such as rue, savin, box, &c., and also tobacco. Experience, however, has determined the specific effects of calomel in this case as absolutely infallible, before the power of which every species of worms and their oviparous remains, indiscriminately fall, and are totally exterminated without the shadow of a doubt. So soon, therefore, as they are suspected, or at least so soon as they are ascertained to have taken possession, it will be prudent to prevent a horse from getting injured in his appetite, reduced in flesh, or altered in condition by their constantly preying upon the contents of the stomach or alimentary canal. To do this, first prepare him as for a dose of physic, by giving bran mashes, &c., and let the dose be adapted to the strength, size, and condition of the subject by these rules. If the horse is thorough bred, and delicate in form, take—

No. 1.

Calomel	1½ drachm.
Linseed Meal	2 do.

Form the ball with honey.

In administering this ball be particular. Give it the last thing at night; then put the setting muzzle on, and let the horse remain without food until the morning, when give a warm mash of bran. Replace the muzzle; and when leaving him, give a handful of sweet hay. Proceed in this manner until about six o'clock at night, when administer the following:—

Barbadoes Aloes	5 drachms.
Gentian	2 do.

Form into a ball with honey.

Put on the muzzle again, and by the time you visit the stable in the morning, it is ten to one but the physic has operated. He must now be treated—but with the greatest care—as in the ordinary course of physic. Probably the reader may not at first imagine why the calomel is recommended to be given alone; but a small quantity of this medicine so given, eighteen hours before the aloetic medicine is given, is not only more efficacious locally, but the whole system becomes impregnated with it. Another thing, superpurgation is not so likely to supervene. There is also another reason; the horse will purge without being taken out to exercise, which when exhibiting calomel is very advantageous, as he does not run so much risk of taking cold. After the lapse of about five or six days, repeat both the balls, as directed above; but do not increase the quantity of the calomel or aloes, until the operation of the second dose has been observed, when a judgment will be able to be formed whether the *aloes* will require increasing or decreasing in quantity. If the horse should want it, or you think the worms are not altogether dislodged from their hold, give a third dose.

If the animal is strong in make, and more like a hackney or coach-horse for size, he may be given,

No. 2.

Calomel	2 drachms.
With the aloetic balls increased	1 do.

Proceeding as before laid down.

Should he be a large, strong, and foul waggon-horse, the calomel ball may be increased to

two drachms and a-half; and if a very large horse, even to three drachms, and the aloetic ball in proportion. By proceeding in this course, the subject will, in a few days, with proper care and attention, and good food and exercise, be freed from the insects with which he has been tormented.

As there will, however, most undoubtedly, be horses, troubled with worms, in the possession of those who, from the nature of their vocations, cannot submit them to so long a respite from business as is necessary for a regular course of the preceding medicines, it will naturally be expected that an effectual substitute should be held forth for the satisfaction of all parties: consequently, we now come to the second remedy, which has been found very efficacious in expelling worms.

Glauber's Salts	4 oz.
Linseed Meal	1 do.
Hot Water.	1 quart.

First mix the meal in a little cold water, to prevent its getting lumpy; and when sufficiently worked up, put it into the salts and hot water. Give this draught with a horn every morning fasting, for six successive mornings. The horse may go to exercise, or slow work of any kind. If he should be perceived to perspire a good deal, and appear faint, discontinue the medicines for a few days; then commence again, until satisfied the worms are completely removed.

JAUNDICE, OR YELLOWS.

This is a disease usually called *yellows*, and is common to horses of every description. It arises from various causes, the most material of which we shall endeavour to explain.

The more simple and least dangerous complaint passing under this denomination, arises solely from an obstruction in the biliary ducts; for the horse has no cystic duct, or gall-bladder, like most other animals. By this obstruction the bile does not flow into the intestines, where, by its peculiarly stimulating property, it excites the peristaltic motion by which they expel their contents. The bile thus impeded in its usual progress, becomes absorbed, incorporating itself again with the blood, and, through the system of circulation, diffusing itself over every part, and denoting its presence by an early appearance of yellowness in the eyes, mouth, tongue, and saliva. To these invariable symptoms may be added, those not altogether so certain in their early state—a general heaviness and dullness, accompanied with loss of appetite, and consequent rejection of food; the animal taking little more than will barely sustain nature. All this is attended with a slight symptomatic fever, which keeps pace with the disease. A sluggishness, or aversion to motion, is plainly perceptible; a foul faint sweat appears upon the least exercise, and the urine is of a dark brown, or saffron tinge: the dung varies much in different subjects, but is, in all, many degrees paler, and more undigested than that of horses in high condition.

The indications of cure naturally arise out of the very description of the disease, to effect which there will not be considerable difficulty, provided it be taken in its early stage, when it may, most probably, be totally removed by the following:—

Cape Aloes	12 drachms.
Calomel	6 do.
Liquorice, powdered . . .	6 do.
Linseed Meal	2 do.

Form into a mass with soft soap.

Divide into twelve balls, and give one every second day. Give the horse half bran and oats wetted for morning and evening feed, and scalded bran mashes for his middle-day feed. If the bran mashes do not sufficiently relax the bowels, give occasionally a clyster of warm water, into which throw a handful of salt.

During this course of medicine, every attention must be paid to appetite, food, and gentle exercise. Mashes of malt and bran may be occasionally given at night, to keep the body lax, and not suffer it to get too much debilitated, but to make the evacuations regular.

The disease, if arising from the cause before mentioned, and treated in its infancy, will generally submit to the above course; but in more advanced cases, double the quantity may be required; and, in addition, three or four quarts of blood taken from the animal will be found highly beneficial. In almost all cases, however, the above balls will be found to have the desired effect. Should you not be so fortunate, or the disease happen to be in a large cart-horse, increase the dose of aloes a little,

according to circumstances. If the horse should be weak and emaciated, decrease it a little. After the medicine has completely set, and the animal appears to be going on well, give the following:—

Cordial Ball.

Anise-seeds	1 oz.
Ginger	1 do.
Liquorice	1 do.
Caraway Seeds	1 do.

Treacle sufficient to form the mass.

Give an ounce of this mixture every morning fasting. Should the subject be a cart-horse, increase the quantities of each, and give an ounce and a-half for a dose.

During the time of taking this, let the former instructions relative to food, exercise, dressing, &c., be strictly adhered to, with such other attentions as circumstances may require, remembering to relinquish the medicine every second morning, or once in three mornings; but not to discontinue it entirely till all symptoms disappear.

A distinct kind of this disease, arising from a remote and very discouraging cause, is that which originates in an induration, or schirrosity of some part of the liver, and which will be indicated by pressing the hand sharply against the region of that organ on the right side. In this species there is little or no hope of obtaining a cure. We can only palliate the disease. The first thing to be done, is to extract blood, to the quantity of three, four, or five quarts. This is of course premised to reduce the contents of, or take off some degree of stricture from, the vessels. Remove obstructions of the body by mashes of bran and speared barley, for two or three days previous to administering any medicines. When the bowels are pretty lax, give

Calomel	6 drachms.
Antimony	6 oz.
Sulphur	6 do.

Rub well together in a mortar, and divide into six powders. Give one of the powders in his feed every other night, first having slightly sprinkled the corn with water. On the intermediate days, in the mornings, give

Glauber Salts	3 oz.
Linseed Meal	2 do.
Cream of Tartar	1 do.

Dissolve the glauber salts and cream of tartar in a quart of warm water, then add the meal, being first mixed with a little cold water. Horn this draught down carefully; and if the disease appears to be removed, give a course of the cordial ball, as directed in the preceding case.

DIARRHŒA, LOOSENESS, OR SCOURING.

This disease is indicated by a weakness in the absorbents to take up the watery matter secreted within the intestines; consequently, an increased action of the peristaltic motion is set up to get rid of this watery fluid; and from this cause the evacuations of the dung are produced in a liquid form. It is not like dysentery; for here the purging, from the first, continues until arrested, the dung also being in a constantly fluid state, there being none of that slimy matter attached to it that is in dysentery. There is little or no fever connected with this disease; and if the pulse should at all become quick or hurried, it proceeds more from debility than from any other cause. This is different in those horses which are likely to purge from excitement; for many horses, full of good keep, with their bowels regularly open, sufficiently healthy, on going to hounds, commence purging instantly. This must spring from nervous excitement. Some horses, more especially light chestnut ones, are liable to purge from the least excitement. Flat-sided, long, lank-legged animals are more subject to intestinal, and other internal diseases, than any other kind of horses. In diarrhœa, however, the horse appears dull, heavy, and inactive, seemingly oppressed, and visibly overloaded, though without any appearance of pain, but subject to general disquietude; whilst the discharge is large in quantity, dark in colour, and fœtid in smell.

Diarrhœa seems to depend on an increase of the peristaltic motion, or of the secretion of the intestines; and besides the causes already enumerated, it may arise from many others, influencing the system generally, or the particular seat of the disease. Of the former kind are colds, checked perspiration, excitement, and other disorders, drastic cathartics, spontaneous acidity, &c. In this complaint, each discharge is usually preceded by a murmuring noise, with a sense of weight and uneasiness in the hypogastrium; and then a horse

is called *wash-bellied*. When it is protracted, the animal loses his appetite, his countenance becomes dull, the skin generally dry, hard, and the coat staring. Ultimately great debility and emaciation, and swelling of the legs, often supervene. Sometimes the disease arises from ulceration of the surface of the intestines. The bile also, from some peculiar change in its nature, occasioned principally by bad food, will produce diarrhœa. The disease, though not so much thought of as it ought to be, is the cause of many a valuable animal becoming a victim, from improper treatment; for some people are apt to go to the other extreme, and administer a long list of astringents to stay the purging, which is highly improper. Debility, and *debility* alone, is the cause of diarrhœa, let it be brought on by whatever means it may.

For its treatment, first, a proper attention should be paid to the food of the animal, such as his hay and corn, which ought to be of the very best quality. Then give of

Blue Pill	1½ oz.
Sulphate of Iron . . .	16 drachms.
Glauber Salts . . .	16 do.
Liquid Laudanum . .	16 do.
Linseed Meal . . .	16 do.

Mix the sulphate of iron with the glauber salts together in a mortar, and pound them very fine; then add the other ingredients, working them well together.

Divide into twelve balls, and give one morning and night.

Boil a teacupful of rice, until it is entirely soft; then squeeze it through a thin tamis, or cloth, and give it in the horse's water to drink.

Should these means not succeed, give the following :—

Sulphate of Iron . . .	12 drachms.
Arsenic	1 do.
Gentian	12 do.
Cape Aloes	12 do.

Mix well together, and form into a mass, with soft soap.

Divide into twelve balls, and give one every morning.

By pursuing this course of strengthening medicine, the horse will speedily regain his appetite, and his usual courage and power. In some cases it is recommended to give a few *cordial balls*, as prescribed in the foregoing case, at intervals, until the disease is entirely removed.

CRIB-BITING.

The peculiar action of crib-biting cannot be mistaken, on seeing the horse that has it, feed; for, at every swallow, an eructation is produced, which, by making the edge of the manger a fixed point, he is enabled to do with ease. This has, by some writers, been said to be exceedingly painful to the animal; but, very frequently, we find crib-bitters not only high-conditioned animals, but fat; and whatever creates pain, cannot produce fat. Still there is a difference in crib-biting horses. Some will crib badly, and get fat; others will become lean; and this appears extraordinary at first sight, but is of great importance; for, as the horse keeps in flesh or condition with crib-biting, or falls off, so will he be sound or otherwise.

The disease, or habit, more properly speaking, takes place mostly in young animals; and here our opinion differs from many others; for we think it is frequently occasioned by uneasiness in cutting the breeding-teeth. Sometimes the cause is, from horses being ill-fed, when they are particularly hungry. Many animals wear away their fore teeth to such a degree that these will not meet, which arises from the inability to gather up their food. But there is one decided symptom of taking in air, and expelling it also at the same moment; for, if it is observed that the horse, while swallowing, expels air, and at the same moment inhales fresh, it is shown in the operation by the expansion of his nostrils.

By some writers, crib-biting has been described as similar to dyspepsia in the human subject; but this is impossible, or how would one horse take it from the other standing in the same stable?—which we have known frequently to be the case; and it is a well-known fact, that no training groom will allow a crib-biter to stand in his stable. We could give numbers of instances to prove the propensity of its being infectious, having had upwards of one hundred and fifty hack horses at one time, and four or five of them rank cribbers. There have been persons who have attempted to introduce cures for crib-biting, but they have not always proved infallible. One is, to buckle a strap round the neck of the horse tightly,

which will prevent it for the time being; another is, to have a number of sharp-pointed studs driven into the strap, to prick the neck and throat every time the subject swallows. Now, if these were efficacious, dyspepsia might be easily cured by tying a neckerchief a little tighter than common; but it is not so, for remove the straps from his throat, and he is as bad as ever.

Professor Coleman says crib-biting arises principally from long fasting, and the noise which arises from the air that is swallowed. But we would ask how spasms of the stomach arise when a man has been without food or drink the whole of the day? Does not the stomach secret wind of itself? or why take a glass of gin or brandy to remove any wind that may be in the stomach? One may feel blown up, as it is said, without food. As gas is generated in the dead, so is it in the living subject. Debility alone will generate it equally in the horse as in the man, only with this difference—that the man can indulge, and the horse cannot.

Some say that giving horses bad keep will produce the affection; but there is no truth in this; for if we look at the horses of farmers, which are kept on the refuse of the farm, we do not find more crib-biters in them than elsewhere. No; but we find them principally amongst high-fed horses; and the reason for this we shall endeavour to explain.—Highly-fed animals are rarely subject to have much hay given them; consequently, the stomach never becomes so full as when it is distended with natural food, such as hay or grass only; for we never heard of a crib-biting horse at grass or on hay only. The real cause is found in a spasmodic affection of the *diaphragm*, generally produced by an error in the dietary of the animal; for if you feed with a considerable quantity of corn, and little hay, crib-biting is produced, and *vice versâ*.

To obviate this affection, the whole of the veterinarians have been equally puzzled. Some years ago, a Mr. Yare invented a kind of muzzle, through which the horse could eat, but was not enabled to seize the manger, in consequence of two iron bars being fixed longitudinally to the mouth part. This invention, however, like many others, entirely failed; for, when removed, the horse would take to his old habit again. Prepared chalk, in two-ounce doses, has been tried, but with no better success. The only thing found, in the shape of a palliative, has been to remove the horse thus affected into a stable by himself, without manger, stall-sides, or anything he can take hold of; and give all his food on the ground, both hay and corn. By this means this troublesome affection has been removed in a great degree, though an entire cure has not been effected.

CHAPTER XXI.

DROPSY—OF THE HEAD; THE CHEST; PERICARDIUM; BELLY; SKIN; SWELLED LEGS.

DROPSY.

Dropsy is a preternatural collection of serous or watery fluid in the cellular substance, or different cavities of the body. It receives different appellations, according to the particular situation of the fluid.

When it is diffused through the cellular membrane, either generally or partially, it is called *anasarca*.

When it is deposited in the cavity of the cranium, it is called *hydrocephalus;* when in the chest, *hydrothorax;* when in the abdomen, *ascites;* and when within the scrotum, *hydrocele*.

We thus particularly enumerate the special names this disease takes, in accordance with its situation, that the reader may not be led astray by the pretender, or country farrier These diseases are of a family nature, and principally originate in debility: such as long-con-

tinued evacuations, the suppression of urine, the sudden striking-in of eruptive humours, the obstruction of the lungs, exposure for a length of time to a moist atmosphere, laxity of the exhalents, defective absorbents, topical weakness—in which case it is most frequent; and, indeed, it may arise from anything that produces *debility*.

DROPSY OF THE HEAD.

This affection does not frequently attack the horse; but when it does so, it is very likely to puzzle the young practitioner, as he may be apt to take it for the staggers, the symptoms being very like those which appear in that disease. Water in the head, when it occurs in the horse, is generally in consequence either of injuries done to the brain itself, or of blows from falls, or from schirrous tumours, or excrescences within the skull, from original laxity, weakness in the brain, or from general debility, and an impoverished state of the blood.

With respect to its proximate cause, very opposite opinions are still entertained by many clever writers; which, in conjunction with the equivocal nature of its symptoms, prove a source of considerable embarrassment to both old and young practitioners. Some believe it to be inflammatory, and, in consequence, bleed largely. Slight inflammation, in the first case, may cause a deposition of fluid on the brain; but this inflammation has, by its effects, produced debility. A torpor of the absorbent vessels may also occasion the disease, and a consequent debility in those vessels to perform their functions.

It sometimes happens in horses that are brought up immediately from grass, and ridden rather sharper than they ought to be, which causes congestion of the brain; but as we shall have to speak of that disease in its proper place, we will now enter on the symptoms of *dropsy in the head*.

When a horse is attacked with this, he refuses his food, hangs his head down in the manger, is dull, and seems careless of all kinds of nourishment; hanging himself forward, resting his whole weight on his fore legs, looking as if he was going to sleep, and wanted rousing up.

When these symptoms appear, a reason must be found for their cause. If they appear in a farmer's horse, not having been recently ridden, it may naturally be concluded that it is congestion of the brain, which may exist without any visible pain or pressure. Should this be the case, the animal must not be bled, but take of

Watery solution of Aloes . .	1½ oz.
Nitre	2 do.
Linseed Meal	2 do.

Mix for a drink, and give immediately.

Let the horse have plenty of room, such as a loose box, or bay of a barn. Let him have plenty of straw, in case he should lie down, and be inclined to roll or knock himself about. Should this treatment not appear to relieve him, apply a blister to the poll or back of the neck, composed of

Cantharides	2 drachms.
Hog's Lard	2 oz.

Let this ointment be well rubbed in behind the ears.

Should the disease be occasioned by blows, or falls, &c., examine the head well for any convincing proof of the pain that may be existing there. Should there be evidence of this, do not hesitate immediately to open the temporal artery, and abstract as much blood as you can, without the horse's fainting. Should he begin to tremble, it is time to leave off, for the object has been gained.

Secure the artery in the following manner:—Have a curved needle, armed with doubled whity-brown thread, and take up the lips as directed in sutures; then lay a pledget of tow over the orifice, tie up the suture, and the bleeding will be stopped.

For feed, give very little, or no hay, but bran mashes. Do not give any corn. We recommend bleeding, if the disease arises from blows, because this is most likely to stimulate the absorbents to perform their natural functions. For the medical treatment, proceed as before directed.

DROPSY OF THE CHEST.

This, as a primary affection, is not common in the horse; but, as a secondary attack, is frequent, and more especially in an attack of inflammation. It consists of a collection of fluid within the cavity of one or both of the pluræ;

and when this is the case, there can be no doubt of its arising from debility. Many gallons of fluid have been found so formed within a very short space of time; in some instances pus has been discovered; in others, matter and other coagulable masses.

The causes of this disease are found principally to be connected with the termination of inflammation of the lungs, and are generally to be discovered by the peculiar action of the horse in breathing, and even in his method of standing—straddling wide with his fore legs. Not unfrequently his breathing is accompanied with a jerk; and if close attention is paid, the water in his chest may be heard to make a sudden noise, as if disturbed. This arises from the lungs taking in air, and, in consequence, becoming dilated, and occasioning the rumbling noise in the chest with the water. Horses that are ill-treated, and have bad keep, will sometimes have dropsy of the chest, when little or no inflammatory action has been going on. Such as have it from these causes, may perform slow work for some time without the disease being discovered, the poverty of the masters not enabling them to procure assistance in time, whereby bad condition is produced in the horse, and consequent debility, until nature takes compassion on the poor animal, and finishes his career in death. On opening the animal, a quantity of yellowish serous fluid is found floating about his chest, the lungs are contracted and smaller, on account of the fluid interfering with them in the cavity, when the horse is then pronounced *rotten*.

In treating for this disease, care must be taken not to determine too hastily on bleeding; for this should never be done, even though the pulse is quick, for the quickness is in consequence of *debility*, and not arising from fever. When the affection is formed, it is seldom or ever that any inflammatory action remains; consequently, blood-letting would be highly injurious, and the result would prove that the cause had been mistaken for the effect. Experience, of course, is the best guide in such cases.

Medicines to promote nausea are frequently said to have a good effect; but we have not found this to be the case, although we have tried them several times, such as white hellebore, in two-dram doses, every five hours. In administering the following, however, our most sanguine expectations have been realised.

Sulphate of Iron	2 oz.
Juniper Berries	2½ do.
Myrrh	2 do.
Antimony.	1 lb.
Sulphur	8 drachms.

Form into a mass with soft soap.

Divide into twelve balls, and give one night and morning.

Rowels and setons sometimes do good in this disease, but they are so long in acting that we would recommend blistering the sides and chest in preference. Give the most nutritious food possible; oats, with a few beans in them for corn, with the best *old hay*, and let oatmeal, or rice, be boiled in the animal's water. Should the above remedies fail, the last resource is to puncture, or tap the chest. Although this operation is delayed almost to the latest period of the disease, and very unfrequently succeeds; still we have been successful in a cure, when driven to this extremity. The earlier it is performed, however, the greater the probability of its having the desired effect.

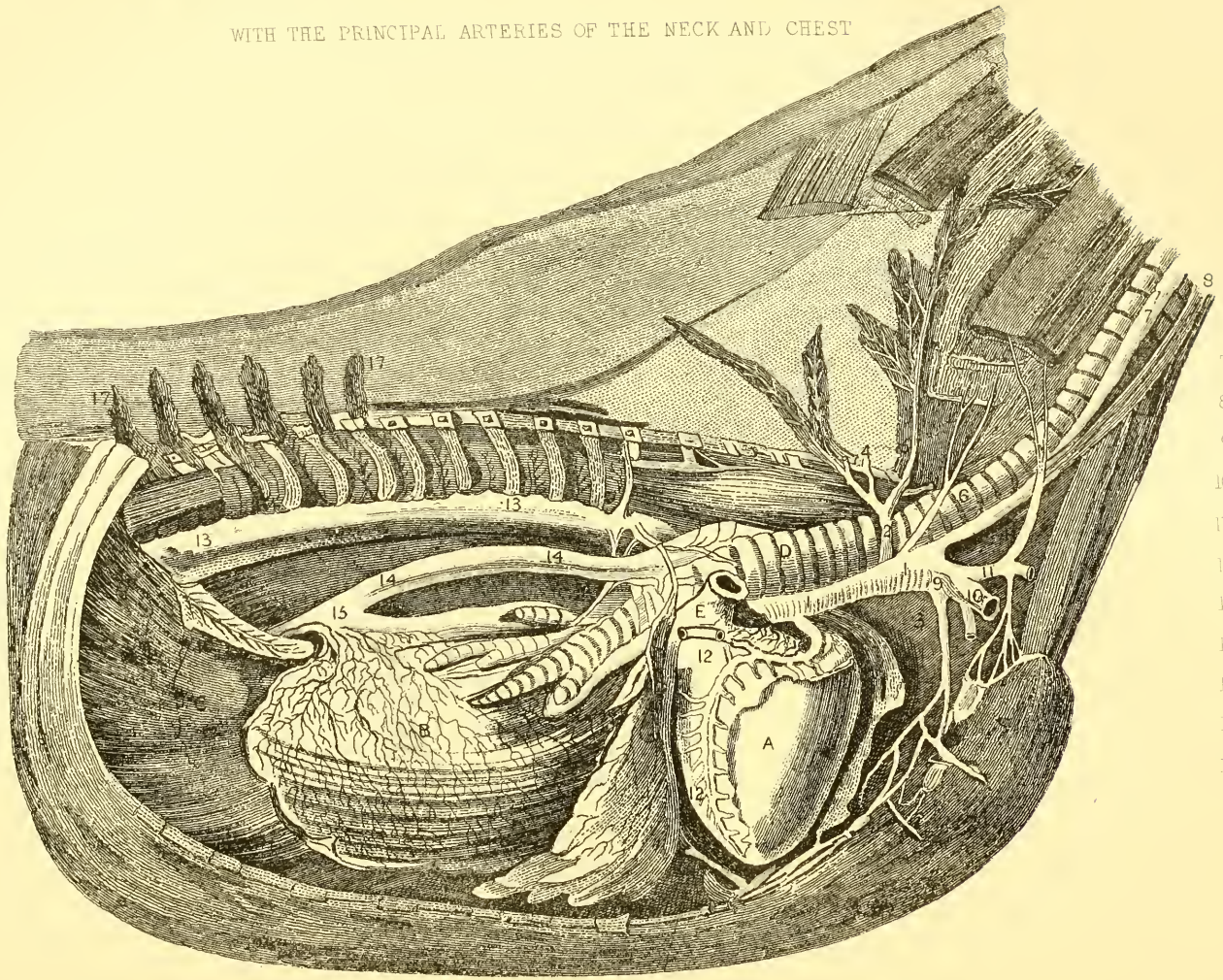
We will now describe the mode of performing the operation.

The situation most eligible for the opening, is that wherein a depending orifice may be gained for the complete evacuation of the water, without danger of wounding important parts by the puncture. If it is carried too low, the mediastinal folds, or even the pericardium may be endangered; but this would only occur where the puncture was attempted perpendicularly, so as to make it between the cartilages of the ribs; but in either of the costal openings, between the seventh and tenth ribs, about an inch above their termination into cartilage,* an opening may be first made by a scalpel, towards the anterior edge of the rib, to avoid wounding the intercostal vessels, first drawing the skin a little forwards or backwards, to ensure a future closing to the access of air. Having done this carefully, introduce a three-inch trochar, by penetrating the muscle between any of the above-mentioned ribs; then withdraw the trochar, and allow the cannula to remain in until the whole of the fluid is drawn off. Having performed this operation, and the discharge of the fluid

* See Plate of Skeleton.

THE ORGANS OF THE HORSE WITHIN THE THORAX

WITH THE PRINCIPAL ARTERIES OF THE NECK AND CHEST



7 Art Carotis dextra
8 Art Carotis Sinistra
9 Art Subclavia dextra
10 Art Axillaris
11 Art. Cervicalis ascendens
12 Art. Coronaria Cordis dextra
13 Aorta posterior
14 The Esophagus
15 Art. Cœliacæ
16 Art. Phrenica anterior
17 The Vessels of the Dorsal Muscles

is such as to carry conviction that you were correct in your judgment, puncture the opposite cavity in a similar manner. If the dropsy, or accumulation of fluid is fully formed—that is, if one or both cavities be nearly filled with serosity—less caution is necessary in the introduction of the trochar; and if the operation is performed early in the disease (which, in general, it should be, to ensure success), then it is necessary to proceed more cautiously, to avoid puncturing the lungs.

Having introduced the trochar only so far as to observe the gush of fluid, put the cannula forward, and retract the other so as to have the cannula alone in the orifice. The cannula must be pushed up to its collar, where it will remain until the fluid is all drawn off.

Coagula, or even the inflation of the lungs, is sometimes found to obstruct the flowing of the latter portions of the fluid. To obviate this, introduce a probe into the cannula occasionally, until you are satisfied that the whole has come away.

When the whole of the fluid has been withdrawn, take out the cannula, and close the orifice by adhesive plaister, or by the common suture. You must not think of performing the operation a second time, although this is frequently done with the human subject; for having drawn off the fluid, reliance must be placed on the medicine before prescribed. Should water again accumulate, the debility will be so much the more increased, and the natural consequence will be that the animal will sink under the disease.

DROPSY OF THE PERICARDIUM.

Dropsy of the pericardium is an increased collection of fluid in the sac surrounding the heart; therefore called dropsy of the heart. The symptoms are the same as in the preceding case; but there is no means of cure for it; therefore, we must submit to nature in this case, and allow her to perform her own operations, obeying her laws.

Frequently the veterinary surgeon is blamed, in this disease, for the losing of an animal which it was impossible to preserve.

DROPSY OF THE BELLY.

This, like the last-named disease, seldom occurs in the horse; but when it does, there is frequently great difficulty in detecting it. It may take place after inflammation of some of the abdominal viscera; and consists of an increased deposit of fluid within the cavity of the belly. Here is formed what is called the peritoneal sac, only of such dimensions as to hold its natural organs, such as the stomach, liver, intestines, &c. If water escapes into this cavity, it at once becomes a foreign body, and is known by the tension of the abdomen, and by the undulations which are felt by one hand, when the belly is gently struck by the other. Also, if the ear is placed on one side of the belly, and some person desired lightly to force the opposite with the hand, the undulating motion of the water will be heard perfectly distinct.

In this disease, the urine is made in small quantities, the thirst is great, and the breathing quick and laborious. This is in consequence of the fluid having taken up a portion of the cavity of the abdomen, and the lungs having become pressed upon, and not left sufficient room to perform their natural functions. From the abdominal viscera, too, pressing upon the diaphragm, the flesh becomes wasted, as well as the adipose matter, which is frequently found floating in the fluid.

For this continuation of symptoms we cannot always rely on a cure; but the disease fortunately happens but seldom, and then it is frequently the sequel of some other disorder of the viscera. If the animal, however, has stamina sufficient, there is a probability of recovery. Diuretic medicines are the only means to rely on, combined with tonics; and we cannot recommend anything better than the prescription laid down for dropsy in the chest. If possible, give exercise, rub the legs well, and bandage with flannel. We have found a cure, if taken in time, effected by blistering all four legs; and where the blisters rise well, this is pretty certain of being the case.

WATER FARCY, OR DROPSY OF THE SKIN.

The proper name of this disease is *anasarca;* but we have kept to the name it is generally known by, and that because it most frequently happens with young horses, and consequently, not having left the hands of the agriculturist, who might be somewhat puzzled without the local name.

Water farcy is described as a species of dropsy, rising from a serous fluid being spread between the skin and flesh; or, rather, it is a general collection of lymph in the cellular system. It shows itself first by a swelling under the horse's belly. This tumefaction is soft and inelastic, and when pressed upon by the finger, retains its mark for some time. By degrees it ascends and occupies the trunk of the body and the neck; even the eyelids, face, and nostrils appear bloated; the lips are much swollen; also the legs and the sheath become greatly enlarged. When the disease arrives to this pitch, breathing becomes difficult, the urine small in quantities, and dark coloured; the bowels are costive, and perspiration much obstructed. A remarkable thirst, attended with emaciation of the whole body, takes place; and to these symptoms may be added, a dull heavy appearance, and sometimes a cough.

In some cases the watar oozes out through the pores of the skin; and the hair, which is, during the spring and the fall, rather longer than at other periods, becomes covered with the fluid thus effused.

This disease may be brought on by all the causes which produce the last-named; but here we should say that debility is the chief cause. It is very frequent in the spring and the fall of the year, when horses are weak from moulting. When the disease is partial, it is not so difficult to cure as when it has become general. In treating for it, we must proceed to rouse the system by giving tonics, the most successful of which will be found in the following:—

Cantharides	1 drachm.
Sulphate of Iron . . .	2 oz.
Sulphate of Copper . . .	2 do.
Gentian	4 do.
Mustard	3 do.
Ginger	3 do.

Mix, and form into a mass with soft soap

Divide into twenty-four balls, and give one every morning.

If the swellings have become considerable, puncture them with a middle-sized phleme, or lancet, in several places, and allow the fluid to evacuate.

Great care must be taken to keep the horse warm. He must be clothed well, and well dressed morning and night; by which means the exhalants of the skin will be opened, and the animal greatly relieved. Attention must also be paid to his feeding, and the most nutritious kinds of food given him; oats, with beans, malt, and occasionally a few carrots. When the weather will permit, let him have exercise, with his clothing on. This will determine blood to the skin, and give him great relief; always remembering to put on him, after he has been dressed, a dry cloth. Do not forget to bandage his legs well with *new flannel* bandages. If he should not be in the debilitated state described, give him, in addition to the medicine prescribed, two or three times a week, at night-time—

Aloes, Cape	12 drachms.
Nitre	12 do.
Resin	12 do.

Mix, and divide into six balls.

SWELLED LEGS.

Swelled legs is a very prevalent disease of the horse, principally affecting the hind, or only one of the hind legs, although the fore are not exempt from the affection. It arises from various causes; but the one we have now to speak of, is occasioned by a deposition of fluid in the cellular membrane of the limbs—commonly in their lower parts, below the knee to the hoof. If the disease is suffered to increase, the skin cracks, and ultimately discharges pus, and then the complaint falls under the head "Grease," which is treated of in its proper place.

Swelled legs may be brought on by poverty, or wet straw-yards, especially where the animal has not been fed well, but kept on the outsides of hay-stacks, or that musty bad hay with which the farmer can do nothing else.

The complaint may supervene on other long-protracted diseases, and any of the above causes may produce it. Bad grooming will also bring it on; and the disease is very painful, and at times occasions lameness, and gives a great deal of trouble.

In all the foregoing stages, it is not difficult to restore the patient; for it is evident that the disease has arisen from the debility of the absorbents to take up the effused fluid, and return it into the system. In treating for it, therefore, we must employ tonic medicines to arouse them to a new action. Bleeding is not

at all necessary; but we would recommend the following:—

Sulphate of Iron	12	drachms.
Cape Aloes	12	do.
Juniper Berries	6	do.
Myrrh	6	do.

Form into a mass with soft soap.

Divide into six balls, and give one every morning. Let the horse's legs be well rubbed and bandaged. Give him gentle exercise once or twice a day; and these things being attended to, with good grooming and nutritious diet, as sweet oats, with a little chaff and bran, and occasionally a few carrots and speared barley, will restore him. Avoid, of all things, giving *beans*, as, when a horse comes from grass, or the straw-yard, and beans immediately given to him to force him, as it is called, the heels generally, after swelling, become cracked. This leads us to consider those other causes which occasion swelled legs, as heated and foul atmosphere, standing long in dung and urine, living high in the stable, and having little or no work. In coach-horses in particular, where their journeys do not exceed eight or ten miles a day, which are generally performed in an hour, or a trifle of time more, the disease is brought on by their standing in the stable twenty-three hours out of the twenty-four. Horses coming into hot stables with their heels wet from having been in water, and not immediately attended to—in most of these cases *local debility* is the cause; but we should not say general debility; because it occurs to horses high fed and exercised, as well as to plethoric animals, which sometimes are neglected. In treating for swelled legs in plethoric horses, bleeding will be highly necessary, with a course of physic—according to strength and constitution—of the purging-balls. After this, administer a dozen of diuretic balls, as prescribed in the list of medicines at the end of this work; and proceed as recommended in the article *Condition*, to which we beg to refer the reader; and which will be found to contain all the directions necessary.

CHAPTER XXII.

DIABETES; BLOODY URINE; STRANGUARY; URINARY ORGANS.

DIABETES, OR PROFUSE STALING.

DIABETES is not frequently found in the horse; but as it is occasionally, it deserves notice. Its indications are great thirst, accompanied with a voracious appetite, gradual emaciation of the whole body, and a frequent discharge of urine, containing a large proportion of saccharine and other matter, voided even in a quantity exceeding that of the aliment or fluid introduced. These are the characteristics of this disease. But it is always much milder when symptomatic, than when it appears as a primary affection. It may be occasioned by the too frequent use of strong diuretic medicines, severe evacuations, or by anything that tends to produce an impoverished state of the blood, or general debility; such as bad hay, heated oats, or such as may have been long on their passage, either from the Baltic or Ireland. It has, however, taken place, in many instances, without an obvious cause.

That which immediately gives rise to the disease, has always been considered as obscure, and various theories have been advanced to account for it. It has been usual to consider it as the effect of relaxation of the kidneys, or as depending on a general colliquation of the fluids. The liver has been thought, by some, to be its chief source; but this organ is hardly ever affected by it.

The primary seat of the disease, although not absolutely determined, is considered, by the majority of practitioners, to be dependent on a primary affection of the kidneys.

It sometimes comes on so slowly and imperceptibly, without any previous disorder, that it, now and then, attains to a considerable degree, and subsists long without being accompanied

by evident disarrangement in any particular part of the system. The intense thirst which always, and the voracious appetite which frequently attend it, being often the only remarkable symptoms. It, however, generally happens that a very considerable affection of the stomach precedes the coming on of the disease; and that in its progress, besides the symptoms already mentioned, there is great dryness and roughness of the coat.

Under a long continuance of the disease, the body becomes much emaciated; the legs swell, great debility arises, and the pulse is weak and small.

In some instances, the quantity of urine expelled is much greater than can be, by any means, accounted for from all sources united; and when subjected to analysis, it is found to contain a considerable quantity of saccharine matter.

On dissecting and examining the kidneys of horses which have fallen victims to this disease, they have invariably appeared to have been much affected. In some instances they have been found in a loose flabby state, much enlarged in size, and of a very pale colour. In others, they have appeared much more vascular than when in a healthy state, approaching pretty nearly to what takes place in inflammation. The bladder, in almost all cases, is found to contain a considerable quantity of muddy urine.

In treating for it, there have been a great variety of remedies proposed; but their success is generally precarious, or, at least, only temporary. Medicines determining blood to the skin, are good for it; therefore we recommend the following:—

Antimony	1 lb.
Sulphur	1 do.

Rub together in a mortar, and divide into two-ounce packets. Give one in the feed, morning and night; first making the feed slightly damp, that the powder may adhere to it.

If the horse should appear weak and much debilitated, give him one of the above powders in his feed every night, and the following the first thing in the morning:—

Opium	½ drachm.
Catechu	3 do.
Arsenic	10 grains.

Form into a ball with syrup of buckthorn.

In addition to this, give about a pint of fresh lime-water, with a horn, every mid-day. To make the lime-water, take of quick-lime, light and fresh-burnt, one pound; put it into an earthen vessel, and pour upon it two gallons of water; let it stand until the lime is settled, then pour off the clean water. It must be kept in bottles, well corked. Keep the horse warm, and well clothed, and give moderate exercise. Do not ride him, but lead him, the groom riding another. Great attention must be paid to his food. If it is at a time of the year when new hay can be got, give some to prevent him from being thirsty. Oats must not be given, but barley, speared, or wheat with it; but not much.

BLOODY URINE.

This is a disease generally caused by some injury done to the kidneys, in straining to draw heavy loads, or carrying heavy burdens. It may be caused by ulceration of the kidneys, produced by violent exercise, or bursting some of the smaller vessels or other urinary passages, or any causes that may occasion rupture of the capillary blood-vessels in those parts. If there is a sudden discharge of pure blood by the urinary passages, it comes from the kidneys; but if a small quantity of dark-coloured blood, whether it be mixed with purulent matter or not, it proceeds from the bladder.

In prescribing for a cure, avoid giving diuretics, for they are very hurtful; and endeavour to restore the parts to a healthy state as soon as possible. With a view to this desirable end, give the following:—

Catechu	3 drachms.
Opium	1 do.
Alum	2 do.
Aloes, Barbadoes . . .	1 do.

Form into a ball with honey or treacle.

Give one morning and night.

Many persons apply hot sheep-skins to the loins, but we never saw much good effect arise from their application. On applying the following, however, great good will arise to the loins of the animal.

Liquor of Ammonia	2 oz.
Olive Oil	2 do.

Rub this on the loins morning and night. Mix, and when applied, shake the bottle well. If the horse is in high condition, take three or

four quarts of blood from him, and keep him warm.

STRANGUARY, OR OBSTRUCTION OF URINE.

This disease consists of an obstruction, or temporary suppression of urine, and may arise from different causes; for, the parts appropriated to the secretion and excretion of urine are so numerous, that the exact cause of the disease becomes a matter of ambiguity and uncertainty, even to very good judges.

Stranguary, sometimes, is a concomitant of inflammatory colic, and is then the effect of pressure from the indurated fæces, or hardened dung, retained in the rectum. When it does not arise from this cause, it may proceed from inflammation of the kidneys themselves, from ulceration, spasms in any particular part, inflammation of the neck, or the bladder itself.

When it is the consequence of colic, and proceeds only from that cause, it may be considered merely symptomatic, and may be entirely subdued on its first appearance. The signs of the suppression are too palpable to be mistaken. The animal is in an almost perpetual position to stale, without effect—indicating, by action and attitude, the expectation of an unusual discharge; when, after frequent straining, the effort terminates in a groan of seeming disappointment. He does not, in general, appear in acute pain, but seems full in the flank, somewhat dejected, and, to a minute observer, appears not only conscious of his inability to stale, but as if supplicating assistance and relief.

The most certain means of affording relief is to abstract about three or four quarts of blood, which will relax the parts; then introduce the hand into the rectum, and remove all hardened dung. This operation—which, by the old farriers, is called *back-raking*—being done, throw up an emollient clyster, composed of—

Thin Gruel	3 pints.
Common Salt	3 table-spoonfuls.

Let this be injected moderately warm, and retained in the body as long as possible, by keeping the tail pressed down against the fundament. If the bleeding and clysters have not had the desired effect in a moderate time, repeat the clyster, and give—

Camphor	2 drachms.
Nitre	1 oz.

Form into a ball with treacle.

Administer as soon as possible.

These are safe, mild, and efficacious measures, and, in general, produce the desired effect, without any uneasy sensations. Repeat the remedies every four or five hours, until the object is gained.

Thus much for stranguary occasioned by spasm, or inflammation of the neck of the bladder; but it may proceed from inflammation or ulceration of the kidneys, accompanied with a paralytic affection or palsy of the parts; in either of which, symptoms are frequently doubtful, and seldom certain. Circumstances may constantly vary in different subjects, so as to render the true seat of disease a matter of conjecture only.

The only symptoms to which some certainty may be attributed are the following:—If proceeding from spasm, on either part, there may be frequent periodical relaxations, which will permit the urine to flow in small quantities for a very short time, when it may as suddenly stop. In this case, the urine will be of its usual colour, or at times rather darker, as if not perfectly complete in its secretion from the blood. In such a case the treatment should be as just pointed out, but with the addition of repeating the bleeding.

Where the case originates in palsy, or ulceration of any of the above-named organs, fulfilling the functions of the evacuations, no great expectation of cure can be indulged in, especially if the case is really one of palsy, which approaches certain death, and which exhibits all the characteristics of the most dangerous species of disease.

CHAPTER XXIII.

CASTRATION, OR GELDING; HERNIA, OR RUPTURE.

CASTRATION, OR GELDING.

THE operation of castrating a horse is by the removal of his testicles, when, in technical language, he becomes what is called *a gelding*. The operation is the cause of the loss, to a considerable degree, of that fiery disposition sometimes displayed in the entire animal, or stallion. The gelding is considered of so much more general use, that few entire horses are kept, except in the racing stud, or by individuals, to breed from.

The proper time for castrating colts, is when they are about twelve, or from that to eighteen months old; but we have known both testicles, even at that age, not having descended into the scrotum. When such is the case, the operation must be delayed a few months longer. Some breeders, according to the custom of their locality, will have their colts cut when they are only about three months old; but, for all general purposes, we should recommend that colts should not be cut earlier than at twelve months. By this time they are better formed, and it is at a time when they cannot be used for any kind of work. In Yorkshire they do not cut until the animals are three or four years old; hence the high breed of coach-horses in that county. Breeders there work them until they are nearly four or more years old, then castrate and bring them out at five years fit for the dealer; and, with the exception of cart-horses, they are the most valuable kind to breed from.

There is a great difference in castrating young colts and old horses—the former requiring no preparatory means to be employed, in consequence of their having been continually at grass. Not so, however, with old horses, which should be bled, and have a dose of physic, and be fed on bran mashes for a week before the operation takes place.

In effecting the operation, the mode of proceeding is to have the horse led out on to some soft straw or loose manure, then the hobbles put on, and the animal cast on his left side. The off hind leg should be secured with the side line, passed through a web collar buckled round the neck, and the line taken round the heel, and again through the collar. Before the operation is commenced, everything should be made perfectly and securely fast, that there may be no possibility of its giving way. Having everything in readiness—such as the smallest scalpel, the clams armed with fresh tow, and a curved needle armed with fine pack-thread, in case of accident—take one of the sacs of the scrotum firmly in the left hand; then having the scalpel in the right, make a section in the skin in the most depending part of the bag, through the integuments, and of sufficient length for the testicle to protrude. Having accomplished this, lay down the scalpel, grasp the protruded testicle with the right hand, and gently draw back the scrotum with the other, so as to expose the spermatic cord, on which fasten the clams sufficiently tight to prevent its slipping. All this being done, take the searing-iron, of a dark red heat, and saw the testicle off. We say *saw*, because if a saw-like motion is made, the end of the cord becomes cerated, and then requires but little more from the iron. Although in all cases it is necessary to touch the end of the cord again before loosening the clams, to prevent bleeding, it is easily accomplished, provided due care is used. The clams may now be gradually loosened; and if blood does not appear, proceed with the other in the same way. Should a little blood escape from the first orifice, do not feel alarmed, for it may be only from the struggling of the horse, which may be permitted now to get up, and let him be placed for a few days in a barn or outhouse. When the horse has been housed, give a diuretic alterative ball, composed of the subjoined ingredients:—

Cape Aloes	3 drachms
Resin	2 do.

Form into a ball with soft soap.

Continue the feed of bran mashes for three or four days, then turn him out.

We have never found this simple method to

fail, if proper care were taken; although it is a matter of wonder to us that many horses do not die, from the rough brutal manner in which the operation is performed in some counties. Some veterinarians will not perform the operation at all, as it requires all the skill of the surgeon.

Whilst serving in India, there was a case in which we were consulted, the subject of which was a beautiful chestnut horse. Although he was perfectly quiet and docile, the scrotum had become so much enlarged in one of the sacs, that it hung down within a few inches of the hock of the animal. On examining this, the testicle was found remarkably small; but it contained a considerable quantity of fluid, which proved the fact that the horse was affected with hydrocele. The fluid could readily have been extracted; but fearing the bag might fill again, it was determined to perform an operation. Accordingly, on cutting through the tunics of the scrotum, at least *three quarts of yellowish fluid* escaped. At this time it was difficult to retain hold of the testicle, from the considerable enlargement of the scrotum. However, this was done, and the clams put well on; but not being contented with doing well, the testicle was immediately removed with a scalpel, leaving the cord only within the clams. With the horse's struggles, and the cremaster muscle being on the stretch, he easily withdrew it from between that instrument, when the cord of course receded into the sac, and bleeding commenced most furiously. A straight needle was then taken, and the glover's suture introduced, when the scrotum filled with blood to a tremendous extent. The horse was then ordered to be kept quiet by himself, and six drachms of aloes given him, with bran mashes and hay. On the following day, the scrotum was immensely large. Some warm water and a sponge was then procured, and the stitches begun to be cut. When this was done, it was found that three parts of a common stable-pailful of coagulated blood came tumbling down through the orifice made for the escape of the testicle. The scrotum was now well syringed with warm water, into which about two ounces of chloride of lime had been put, until all appeared safe, and no discharge of blood whatever was seen. The scrotum was dressed in this manner for three or four days internally, and regularly bathed with warm water outwardly, and around the sheath, three times a day. In three days over a month the horse was fit to be ridden.

The clams used in India are made from a round piece of wood about the size of the handle of a sweeping-broom, and are about five inches long. They are slit down the middle; so that they have two flat sides, with a groove about the size of a goose-quill up the middle. This groove is filled with corrosive sublimate, one drachm, and hog's lard sufficient to form an ointment. They are, before placing on the cord, tied together at one end, then at the other pressed together with pincers and tied at the other: these are taken off *on the morrow after the operation.*

In performing the operation of castration, there are cautions required, and those of moment; and although the operation is mainly performed by ignorant men, who are called *cutters or gelders*, and, to all appearance, things go on as they should do; yet if any alteration for the worse takes place, these men do not understand what to do. It therefore behoves every man who undertakes the operation, to be well informed, not only of the parts involved in it, but their means of cure.

The greatest enemy the operator has to contend with, is inflammation of the parts. Should this take place, and the horse walk stiff on his hind legs, moving with a straddling gait—especially if he be an old one—the parts should be well bathed with warm water three or four times a day, and each time wiped thoroughly dry; then the enlarged scrotum and sheath should be rubbed all over with good digestive ointment, some of which may be introduced into the sac, which will promote a discharge. Give the ball, as recommended before, every second day, until the swelling goes done.

The food must be regulated according to the age or size of the horse; but much corn must not be given him; bran mashes, green food, &c., are the best. To old animals, if attacked with swellings after the operation, a dose of physic must be given; and they should be bled. All the other applications will be needful to be attended to, precisely in the same manner as directed for young horses.

Lock-jaw not unfrequently supervenes on this operation in India, in consequence of the injury the nerve sustains, from the operator pulling at the testicle too forcibly, as already described.

HERNIA, OR RUPTURE.

Hernia, or rupture, is the displacement of a portion of the abdominal contents, from the cavity outwards, by some of the natural, or by some artificial openings. The intestines are by far the most common of the abdominal viscera. When such displacement occurs through an opening, and the protruded part can be readily returned, it is considered as reducible hernia. If, on the other hand, the opening is too small, of course it becomes irreducible. If the mouth of the sac around the intestine constricts, and produces inflammation of the gut, it then forms what is called strangulated hernia, and sometimes proves fatal, unless relief be promptly obtained.

From the position of the horse, stallions are frequently affected with scrotal hernia, from the scrotal cavity remaining open to the abdomen, and the intestine descending; but this is not the case with geldings, for the absorption which takes place after castration, almost prevents the possibility of scrotal hernia. In India, scrotal hernias are almost of daily occurrence, especially with horses which have violent action to perform, and are of a loose weak nature. Castration is not general in India; and the relaxing state of the climate may be considered to be the principal cause of this, as the operation is attended, not only with inconvenience, but great danger.

Omental hernia is exceedingly common in the East, where the operation of castration having been performed on a horse, the omentum protrudes of itself. The clams were put on, and the finger introduced into the sac, which, as far as it could be felt, was ripped off. The horse did well afterwards. Accidents, violent exertion, kicks, gores from neat cattle, may produce ventral hernia in any part of the cavity, and they will form a pouch or sac.

Horses may die from strangulated hernia; the death of which may be attributed to simple enterites, or any other cause. There was, in Devonport, a case of a black horse, which, on being brought into stable, evinced symptoms of enterites. He was bled to about six quarts; ordered gruel with clysters, as if for enterites. Some hours afterwards it was found that the horse was not better. Counter-irritation was then prescribed, but to no effect. The horse died soon afterwards; and on opening him, a strong ligamentous cord, as thick as a man's finger, was found inserted into the peritoneum, and continued up to the mesentery, into which it was equally firmly inserted. Now, by some violent exertion in going on the roads of Cornwall, where the horse was worked, the intestines had been thrown over this cord, and could not replace themselves. Strangulation was the consequence, clearly showing that violent exertions produce the disease.—To return, however, to our subject.

Most cases of reducible hernia, originating in accident to the walls of the abdomen, can only be supported by a bandage; the great force of the abdominal muscles, and our inability to keep the animal perfectly still while the parts unite, preventing their permanent reduction.

With scrotal hernia, however, we have a much greater advantage; and although the temporary reduction of the gut may be commonly affected by the application of the *texis*, or by pressure, we have performed this operation when the accident never occurred again.

The symptoms which indicate scrotal hernia appear in some of the actions of the animal. He paws continually; lies down, and as frequently gets up; sweats profusely about his loins and quarters; sometimes takes a roll; but this appears to be done with such difficulty, that after immediately doing so, he will jump up so suddenly, that it is difficult to get out of his way. If the horse is an entire—for we have heard writers talk of scrotal hernia in geldings, although an instance never came under our notice—examine well the scrotum, in reference to its fulness and tensity. Being satisfied on this point, have the horse's four legs secured, and drawn by a rope until he completely lies on his back. This being done, endeavour to return the gut, by taking hold of the scrotum of the diseased side, and pressing it back through the fore finger and thumb. Should this not be readily accomplished, recourse must be had to the operation for hernia. When this is the case, take the diseased sac into the left hand

lightly; then, instead of cutting at the most pendulous part of the sac, as in castration, cautiously cut into the sac near the seam or pubis, running between the sacs of the scrotum. Next take the scalpel, and divide the integuments carefully, until the contents of the sac can be felt with the finger. The opening made should be so small as only to admit the point of the fore finger. If the sac should be large or dilated, first make an incision on the side, that the fore finger may be introduced as far as possible; then a second cut should be made, allowing the finger to be the director. This being accomplished, introduce the finger into the abdomen, and feel for the abdominal ring. When this has been accomplished, take a bistory, and run it down by your finger, and partially cut through the ring, keeping the edge of the bistory bearing forward and upward. Should you succeed in reducing the hernia at first, the object is gained; but if not, you may cautiously try again, and divide the ring, should such be required. Immediately castrate the horse on that side. Give a gentle dose of medicine and soft food, as bran mashes, &c.

CHAPTER XXIV.

STRAINS.—STRAINS IN GENERAL; IN THE SHOULDER; BACK SINEWS; OVER-STEPPING; BREAKING-DOWN; RUPTURE OF THE BACK SINEW; STRAIN OF THE FETLOCK JOINT; COFFIN JOINT; ROUND BONE; STIFLE JOINT; ON CURB.

STRAINS IN GENERAL.

STRAINS are of two kinds; the one originating in the ligamentary parts, by which the different joints are preserved in contact: the other, in a relaxation of the muscles or tendons, or in a rupture of any of the membranes covering or adhering to such tendons, the purposes of which are the direct office of motion. Hence it is, that the farrier and the groom are so frequently at a loss for their definition of any particular lameness, fixing by conjecture upon any part, and attributing it to any cause but the right one. In giving their judgments, of course, they are seldom directed by any mental information, having little or no conception or scientific knowledge of the structure of parts, their purposes or appropriations.

The elastic part of a tendon or sinew, is that which is the muscular, of which, in fact, the tendon is a continuation only, with this difference, that the tendon is made by nature to occupy a much smaller space than the muscle; for it would destroy the symmetry of the animal if the muscles of the fore leg were to extend down to the heel, instead of that fine uniform make which the tendon gives, especially to the race-horse. The tendon is not of that elastic nature that some writers have described, but it is in the muscular end where the elasticity exists. This, at first sight, may appear strange, for the injury takes place in the tendon, and not in the muscle; and for this reason, the *non-elasticity* of the tendon and its sheath will rather submit to rupture, from want of the elastic quality. These tendons, or sinews, are strong substances, composed of innumerable threads or fibres, possessing the properties of extension and contraction to a certain degree, beyond which their flexibility cannot be extended without palpable injury and certain lameness; for by overstraining their elastic quality, small as it is, rupture is the consequence, accompanied with lameness in proportion to the injury sustained.

To render this idea as clear as possible, let us suppose that a horse is going at his best pace on the trot, and in so doing his *toe* covers a prominence, or the edge of one. In such a case the heel has no support; and the consequence is, an extension of the tendons, or a rupture of the same; by which means part of nature's work is destroyed, and what is termed

letting down of the back sinews, has taken place. Instances of this are frequent on the turf, when the horse is said to be "broken down."

When this has happened, the first thing to be done is to prevent, as much as possible, inflammation from taking place in the parts.

To this end, take away, so soon as convenient after the injury is sustained, a portion of blood adequate to the state and strength of the subject, from a vein as contiguous to the part affected as may be consistent; and as success will in a great degree depend upon the earliest applications, take of

Vinegar . . . . . 1 quart.

Make this hot, and add extract of Saturn, one ounce.

Foment the leg with this until it is exhausted—say for two or three times a day; and after each fomentation, bandage the leg well and firm, with a woollen bandage. Give bran mashes for a day or two, and the following:—

Cape Aloes . . . . 2 drachms.
Juniper Berries . . . 1 do.
Form into a ball with soft soap.

Give one every other night.

After fomenting with the above for two days, use the following embrocation. Let two or three table-spoonfuls be gently and gradually rubbed into the affected part, every night and morning, always remembering to use the bandage tolerably tight and firm:—

Liniment for Strains.

Barbadoes Tar . . . . . 2 oz.
Spirits of Turpentine . . . 2 do.
Opodeldoc . . . . . 4 do.

Mix well together, and keep well stopped for use.

Whilst applying this liniment, rest must be given to the animal. Too much stress cannot be laid upon this first necessity, from which the greatest good must certainly result. It is to the want of patience and mercy only, that we are to attribute the blemishes to be found in such an infinite number of fine horses. Were such horses indulged with proper time in the field, or the luxury of a loose box, many of them would be saved from having their legs seared with the hot iron. Although the present age is full of equestrian sagacity and penetration, few can be found, whose reason or experience has demonstrated to them the absolute necessity of time and rest to restore the tone of a relaxed muscle or tendon.

When the horse has continued in the stable, under the treatment mentioned, for at least a fortnight, he should, if in the winter-time, have his liberty in a loose box, bay of a barn, or large stable, where he will, by a natural attention to his own ease and safety—unless hurried, driven, or disturbed, which should by all means be prevented—sufficiently guard the injured parts. On the contrary, if in the summer, he should be turned into a paddock or pasture, alone, at a distance from other animals, where he cannot, by their neighings, be excited to any exertion of spirit or extravagance that may occasion a relapse. In either case, if the enlargement of the part does not subside, and the lameness bears no visible marks of amendment so soon as may be reasonably expected, take him up, and apply a liquid blister, composed of the following ingredients:—

Mild Liquid Blister.

Cantharides, powdered . . . 4 drachms.
Vinegar . . . . . 4 oz.

Mix well together.

This must be gradually rubbed over the whole part for at least half-an-hour, letting it, if possible, be entirely absorbed around the seat of pain; then apply the bandage as before described, and shorten the halter, to prevent the horse from gnawing the part. At the expiration of three or four days, he may either be turned out, or put into a loose box, as the time of year may serve; but let the time of year be what it may, a loose box is preferable to anything. When he is first brought into use, let his work or exercise be gentle, for fear of a relapse. If this should occur from some accident or misadventure, the following lotion must be applied to the affected part:—

The best Vinegar, or Verjuice . . 1 quart.
Common Salt . . . . . 4 oz.

Rub the parts well with this twice a day.

By pursuing this mode of treatment, we have seen the complete cure of many, without the necessity of firing, which is in general by far too hastily adopted, and hurried on by the frequently unnecessary anxiety of the farrier. With all kinds of strains, however, the animal must have rest; and to this alone, nine times out of ten, the cure is to be attributed. Even

after firing, in extreme cases, turning out, and taking the horse up sound, the cure or soundness is rather to be assigned to the rest than the firing.

Strains in the ligamentary parts are in general occasioned by sudden jerks, short turns, or they may arise from the limbs sinking in deep ground, and the exertions which have to be made to get them extricated. The ligamentary parts being situated at the junction of bones, and, in some cases, covered with muscles and soft parts, no great expectation of relief can be formed from the efficacy of external application, when the seat of pain is unluckily so remote from the surface. We will now, however, enter upon a more especial description of strains, and their mode of treatment, when they occur in particular parts of the anatomical structure.

STRAIN IN THE SHOULDER.

Strain in the shoulder was formerly called chest, or body founder. Where there is strain in the shoulder, there cannot be the slightest mistake in discovering it, for the horse, in his pace, makes a circuitous or rotary motion of the leg that is affected, and drags his toe on the ground, in endeavouring to bring it forward. He also, if we may be allowed the term, appears to *hutch* up that side altogether, in endeavouring to walk.

These strains are frequently the consequence of a side wrench, or slip, by which the fore legs become so widely separated, that the muscles are stretched to an unnatural extent, or, in some cases, are actually ruptured; the greatest pain being evinced. The ligamentous attachment also participates in the injury, as the muscles of these parts are of themselves of a peculiarly delicate and tender nature, so as easily to become ruptured. Shoulder strains do not frequently occur; though grooms and farriers, and other persons connected with horses, are often led, from habit, to attribute to them every lameness they do not understand, and the seat of which does not make itself evident to the untutored senses; for, on viewing a horse in front, the muscles of one shoulder will sometimes appear wasted. Though this be so evident, it requires more than usual explanation to make even intelligent persons believe that the evil did not originate where it appears to have done. In all affections of the feet, where there is much pain and lameness, nine times out of ten, the lameness is placed on the shoulder, and this in consequence of persons not knowing the real seat of disease; for the horse will draw his fore legs closer together, when the spine of the blade-bone becomes prominent, and the whole substance seems lessened. The origin is from inaction, in which case muscles always diminish; added to which, the pain the animal is continually in, occasions him to give rest to the diseased limb.

It is very necessary, therefore, to be able accurately to distinguish shoulder strain; and if proper attention is paid to the rules before laid down, as to the action of the leg, there will be but little difficulty in at once pronouncing where the seat of lameness exists. When the horse is at rest, the limb is generally pushed forward, the animal scarcely daring to touch the ground with it, the toe only just resting on it, as we see when he seems to be in the act of lifting the leg. By these means it is easy to distinguish shoulder strain from diseases of the feet; for in those cases, the horse puts his foot straight out—what is called *pointing*—resting on the entire foot. These symptoms being so entirely different to affections of the feet, there can be no difficulty in determining between the two, especially if, in taking the leg off the ground, and extending it forward as much as possible, the muscles of the chest are at the same time pressed. This will at once determine, in the mind of a judge, the seat of lameness.

The seat of the lameness being discovered, we refer the reader to that portion of the work treating of *Strains in General;* and, as a remedy, we recommend the use of the liniment directed for strains.

Some people prefer what are called repellents, or cold applications; but these will be always found to fail, nothing answering so well as a remedy that will promote the action of the absorbents, and, at the same time, act as a counter-irritant. Should the injury to the parts occasion a degree of fever, let blood be taken from the jugular vein, according to the size and strength of the animal. Apply then the tar liniment; but do not apply a common blister,

whether the lameness arise from a ligamentous strain of the shoulder, or from the muscles of the chest; for, at best, either blemish or eschar will be produced. As a mild application in the form of a blister, we recommend the mild liquid blister in the article on *Strains in General.* Apply as directed under the head of that article, rubbing on the affected part, morning and night, until the swelling and inflammation will not allow this to be continued longer. Be not alarmed at this, but wait for two or three days, and the swelling will subside, when the application should be repeated, until the same effects again prevent the application. In this way a mild inflammation should be kept up for a week or ten days, in accordance with the abatement of the disease. It is very seldom necessary to continue the application after the second time, the disease generally yielding by that time to its use. This will be found a much more eligible mode of practice than the common blister ointment.

In addition to the above remedies, the alterative medicine, as before directed, must not be forgotten to be given, as it will not only keep the system cool, but will promote the absorption of any extravasated fluid that may have taken place in consequence of the injury.

There is one thing in strain of the shoulder, which must in nowise be lost sight of; and that is rest. We have already mentioned this in the article on *Strains in General;* but it cannot be too deeply impressed on the minds of the keepers of horses; for, though the lameness may disappear on bringing the animal first to work, in nine cases out of ten, the lameness will return on the least exertion. We would, therefore, again recommend at least a month or two in a loose box, or in a field where he can be quiet, previous to using him, though he may not appear lame.

Horses sometimes, from other horses, receive kicks, which affect the shoulder, and occasion considerable lameness, when there is no strain whatever. When such is the case, bathe the shoulder well with warm water; after which, wipe completely dry, and apply the tar liniment, as directed before. Insert a rowel in the chest, which will be preferable to bleeding in the plate vein.

STRAIN OR CLAP IN THE BACK SINEWS.

A strain, or clap in the back sinews, is not thought so much of by some writers as it really deserves; but it rarely occurs, that a horse when once strained in his back sinews, or tendons, or their sheaths, ever becomes able to perform much hard work. Still, we have known both race-horses and hunters to be capable of work after an accident of this kind; but not frequently so. However, as the disease is one which often occurs, we must do our best to alleviate the acuteness of the pain under which the animal labours when visited by such an affliction.

Referring to the article on *Strains in General,* it is there stated, that laceration of some of the ligamentous fibres may occasion the affection; still it is, however, more generally confined to a distension of those parts, and of the sheaths of the tendons beyond their structural capacity; although there is little reason to doubt that the tendons themselves are also sometimes acted on. This disease may occur to the hind legs, as well as to the fore ones; but we never saw it attack the hind legs. It may, however, be brought on in the fore legs by treading on anything suddenly; such as in downward leaps, in attempting to recover a false step, or treading unevenly on any hard or prominent substance. It is also occasioned frequently by lowering the heels too much, or too suddenly, by which the tendons are brought too much into action. When the injury has occurred, inflammation, with all its attendants of heat, swelling, pain, and lameness, and, in all probability, an incapability of extending the limb, come on. The effusion from the ruptured vessels may be absorbed with proper treatment; but if coagulate lymph is once formed, it will either be accomplished, or, perhaps, not at all. More especially this will be the case if the lymph should be thrown out between the tendon and its sheath, where it is not so readily absorbed, and where it may form callosities around the back sinews, which so frequently follow these accidents, and, by their enlargement, obstruct the motion of the limbs, which is felt in a great degree after exertion, and is shown in a particular manner at first starting. Having become warm, however, the lameness apparently leaves him; and it is

then said by persons who have to drive such a horse, "*Oh! it will go off as he becomes warm;*" not at all reflecting on the sufferings of the poor animal. The action of exercise, occasioning friction, produces warmth, stimulates the absorbents to take up the fluid from the mouth of the ruptured vessels, and consequently, for a time, or when the horse is in action, the swelling and lameness either partially or wholly disappear. From these circumstances, the advantage of hand-rubbing and the flannel bandage will at once be perceived.

For the treatment of strain in the back sinews, we must refer our readers to where we have treated of strains in general. Here, however, we may add, that on the first discovery of the accident, the shoes should be taken off, and the heels turned up about half an inch. This will greatly relieve the pain under which the animal may be labouring. Bleed in the plate vein; next bathe the leg in warm water, and use the "tar liniment," as before directed. If symptomatic fever should come on, use the alterative medicine, and a cooling diet, as bran mashes, and a few carrots, now and then; corn need not be so plentifully given.

Should the repetition of the liquid blister not be successful, have recourse to firing; and, with care, this operation may be performed not only with neatness, but as scarcely to be seen. We have, in severe cases, been obliged to fire twice, which has proved successful; still we do not recommend firing until all other remedies fail; and previous to which, we would advise the application of mercurial plaister; or, perhaps, what may be more convenient, mercurial ointment. Take of

Mercurial Ointment (strong) . . . 2 oz.

Rub a portion of this on the diseased part, first warming it to make it pliable, morning and night, for three days; then, waiting one day, apply the liquid blister as before described. Put a cradle on the neck of the horse, to prevent his biting the parts; and if he appears irritable, tie him up to the rack.

OVER-STEPPING.

Over-stepping, or, as it is called by some, over-reaching, arises from a peculiar length of action which the hind legs have to the fore ones, in consequence of which the fore legs cannot get out of the way of the hind ones. When this occurs it is very liable to injure the fore legs, and, in some cases, so much so, as to throw the horse down.

Over-stepping sometimes happens from the toe of the hind foot being too long, and not squared off properly. It may also occur from bad riding, in pulling up short, or by a horse galloping with the wrong leg first, which altogether alters his gait, so much so as to be uncomfortable to both "man and beast." The consequence is, that in the attempt to get himself into the proper mode of gallop, he will strike his hind foot against his fore leg; and, if he does not come down, will lacerate the leg, sometimes in a terrible manner. Whenever the wound is such as to leave a flap of skin, whether it is upwards or downwards, or sideways, it should immediately be cut off as close as possible, as a reunion of the parts can never take place; and by leaving the flap, and attempting to effect the reunion of the parts, there would be a thickening and a greater blemish, and its removal would be found necessary at last.

Though we have introduced this affection in the chapter on Strains, it probably would have been better in the chapter on Wounds; but it so frequently happens that the tendons become injured by the blow inflicted, that we may be pardoned for including it with diseases of the tendons.

In treating for over-stepping, poulticing will be highly advisable; and nothing can be better than a warm bran poultice, which should be applied until the inflammation is subdued, always recollecting to bathe the leg in hot water. When the inflammation is removed, use the following two or three times a day:—

Hog's Lard . . . . . 2 oz.
Alum, finely powdered . . . 3 do.
Sulphate of Zinc . . . . ¼ do.

Work these ingredients well together in a mortar, and apply as above. A cure may be expected in a few days.

BREAKING-DOWN.

Breaking-down is a term so generally understood, that it is familiar to all sportsmen and horsemen, though, in medical language, it is called "*rupture of the suspensory ligaments.*" This is an accident that most frequently occurs

to young horses, either in breaking or training, and more particularly so to the race-horse than to any other. The severe training the race-horse has to undergo at the present day, makes him exceedingly liable to rupture the suspensory ligament; as the fixed point of it being immediately under the knee, and then inserted into the heads of the sesamoid bones, puts this ligament so much upon the stretch, that at every bound the horse takes, there is no wonder it becomes ruptured; especially when we take into consideration the age at which horses are brought to the course now-a-days, to what they formerly were, and also the pace at which they go. Though the distance may be short, it is *the pace that kills.*

It has been supposed by some, that this accident has arisen from a rupture in the flexor tendon; and we have known, after the operation of *neurotomy*, the flexor tendon to be partially divided, and the horse go as if rupture of the suspensory ligaments had taken place. The limb, in such a case, betrays the greatest weakness, and the fetlock is almost brought to the ground.

A perfect cure is seldom obtained; but there have been cases where horses have broken down, and been able to race again, and become valuable. We could relate several instances of the sort; but we will rather proceed to the cure of breaking-down.

The first thing to be done is to bathe the leg well in hot water; then send for the shoeing smith, and direct him to put on a high-heeled shoe, in order to relieve the parts. The horse, in consequence of the pain he endures, will be anxious to eat. Therefore give him cold bran mashes, and the alterative ball, as prescribed in "Strains in General." This being done, apply the tar liniment, as before directed, well bandaging the leg, from the knee to the fetlock joint, or a little below it. If, after the trial of this application for about a fortnight, it does not succeed, proceed to firing; for the mode of performing which, *see* Plate.

RUPTURE OF THE BACK SINEW.

This is an injury that does not frequently occur, though the former injury is in many instances mistaken for it; but they are not the same cases. Though the membranes and the small vessels supplying them with blood, frequently become ruptured, and occasion great lameness, still the substance of the sinew rarely is ruptured. In such a case we should recommend the same treatment as in the preceding, which will be always found the best; and if necessity requires it, recourse to firing must be had. Here rest will be a grand auxiliary, and in a loose box, if possible; for, from the frequent excitements which a horse has in the field, he is apt to forget his lameness for the time, and commence galloping about, much to his detriment, and to the retardment of his cure. Slinging has been recommended in cases of this injury; but the great difficulty in keeping horses suspended is such, that we never saw any good arise from it.

STRAIN OF THE FETLOCK JOINT.

This arises from injury done to the ligamentous and tendinous connexion of these parts, either from long-continued exertion, or from the effects of more momentary, but violent efforts; such as are made in leaping, or alighting on unequal or stony ground; by which means the leg may be turned aside, similar to sprain of the ankle of the human subject. Another cause is, that some horses, let them be going at whatever pace they may, occasionally have a peculiar drop behind. This principally arises from debility, or from the animal having travelled too far, and exhaustion taken place. Though this at first seems but trifling, it occasions great pain to the horse. Here the tar liniment will be found of great benefit, seldom failing to remove the lameness in a few days. In all these cases, the warm-water bath and the flannel bandage should be used.

STRAIN IN THE COFFIN JOINT.

Strain in the coffin, as it is termed by farriers and grooms, is not so common a case as is generally thought to exist; for its being confined partially to the hoof, prevents its being subject to those strains to which other joints are liable.

When a horse becomes lame, an attentive examination of the feet and coronet should not escape the attentive observer; but if heat is found about the coronet, this is not to be taken for the disease.

The lateral ligaments uniting the small pastern bone to the coffin bone, being the seat of disease, not unfrequently ossific matter is secreted, arising from the inflammation that proceeds from the strain. To ascertain if this be the case, pass the hand carefully down the fetlock-joint, until it comes to two little prominences. Just above these is the junction or union of the large and small pastern bones: and where this disease exists, considerable heat will be felt; and on pressure, the horse will exhibit considerable pain and uneasiness.

In treating for this kind of strain, bleed in the pastern vein, or, probably, what will be more convenient, take blood from the foot: previous to which, immerse the foot in hot water for at least half-an-hour, changing the water as it becomes cool. After this, apply the mild blister ointment, as directed in the list of medicines. Should this prove ineffectual, have recourse to firing.

STRAIN OF THE ROUND BONE.

The old farriers attribute lameness behind to strain in the round bone, or stifle, just as their fancy leads them to favour one or the other. However, sometimes the ligaments of this joint become injured by violence. A horse in a narrow stall, may injure himself, either by turning round, or by getting up, or lying down; and we have known some so much injured, that what with their exertions in getting up, and with the narrowness of the stall, they have considerably injured themselves in making an effort to rise. This injury has arisen from the ligaments of the articulation bone of the thigh with the pelvis becoming strained.

For the treatment here we must not employ either blister or setons, for the deep-seated situation of the injury prevents this mode of treatment being of much avail; and if the part is fired over, there is then a confirmed blemish. The best thing to do is to use

Tartar Emetic	1 drachm.
Hog's Lard	1 oz.

Rub these well together, and apply to the parts affected, morning and night, until pimples arise; then desist. Apply a little hog's lard occasionally, to make the parts supple; and all will, in a short time, be right.

STRAIN OF THE STIFLE-JOINT.

Injury or strain of the stifle-joint frequently occurs from the horse slipping suddenly outwards, and causing the ligaments to become extended beyond their capacity. It may also arise from kicks or other injuries. In such cases the limb has a peculiar rotatory motion, being dragged after the animal with the greatest pain, and apparently even with a considerable effort to move at all. Sometimes the muscles of the thigh are the parts alone which are injured, and which produce the lameness.

For treatment, we recommend the "tar liniment," which we have always found to have the desired effect. Should this not succeed, try the mild liquid blister, set down in "Strains in General." Do not think of firing, as the blemish thereby incurred is a stain in the horse's character ever afterwards.

ON CURB.

This affection has been generally applied to a partial dislocation of the *os calcis;* but this is not the case, it being a rupture of the membranes of the sheath of the tendons just passing over the lower end of the *metatarsal* bones of the hock-joint, which sheath is placed there to strengthen the parts where the most considerable point of action in the hind extremity is required. Hence this affection arises so frequently from any sudden action; from leaps, or where the propelling motion is brought most into use; also rearing, or a sudden slip will produce it. It frequently makes its appearance unexpectedly from the above causes.

Curb may appear without lameness, from malformation of the hock, which is called *sickled hocked,* though no curb in reality exists. The lameness arising from curb is excessively painful to the horse, though some writers deny this; but any theæcal rupture cannot possibly occur without giving great pain, as the animal cannot move without bringing the diseased parts into action.

For the cure of curb, the practice at the Royal Veterinary College, is to put on a high-heeled shoe, and bathe the hock frequently with cold water, or cold salt and water; but these applications seldom or ever succeed. When this is the case, a seton is passed over

the part, which has just as much effect as passing a seton down the fore leg, in order to remove this accident. For feed and medicine we refer to the article on "Strains in General;" where all the required information will be found.

CHAPTER XXV.

INFLAMMATIONS.

The term *inflammation* is generally understood as expressing that state of a part in which it is painful, hotter, and somewhat more turgid than it naturally is; such topical symptoms, when present in any considerable degree, or when they affect very sensitive parts, being attended with fever, or a general diseased action of the system.

The susceptibility of the body to inflammation is of two kinds—the one original, constituting a part of the animal economy, and beyond the reach of human investigation; the other acquired from the influence of the weather, sudden changes from hot to cold, and also from cold to hot stables, not well ventilated; blows, kicks, &c. The first kind of susceptibility cannot so well be diminished by art, as some animals are exceedingly liable to inflammatory attacks from their form; such as narrow-chested horses, or light chestnut ones. The second may be lessened by the mere avoidance of the particular causes upon which it depends.

Inflammation may, with great propriety, be divided into the healthy and the unhealthy. Of the first, there can be only one kind; of the second, there may be many, according to nature and situation, and kind of disease. It may also be divided into the *acute* and *chronic*. Healthy inflammation is generally quick in its progress, for which reason it must always rank as an *acute* species of the affection. Chronic inflammation is always accompanied with a diseased action, as exemplified in tumours, &c.

PRINCIPLES OF INFLAMMATION.

There is much foundation for believing that healthy inflammation is obedient to ordained principles, according to the tone of the constitution, or the structure or situation of the parts affected. The nature of the existing cause can have no share in modifying its appearance, whether this be occasioned by the application of heat, or by violence done. Healthy inflammation is always the same in its nature, and all the influence is proportioned to the degree of violence accompanying these causes.

The observations of experience, as being the only solid basis of all medical as well as other knowledge, has informed the practitioner, that parts which, from their vicinity to the source of the circulation of blood, undergo inflammation more favourably, resist disease better than those parts which are more remote from the heart. The extremities are more prone to inflammation and disease in general, than parts nearer the heart; and when inflamed or cracked, they are longer in getting well. The circumstance of their being depending parts, which retards the return of blood through the veins, must also increase the backwardness of such parts in any salutary process.

Inflammation, when situated in highly organised and very vascular parts, is more disposed to take a prosperous course; and is much more reducible by art, than parts of an opposite texture. The nearer, also, such vascular parts are to the heart, the greater will be their tendency to do well in inflammation. Hence, inflammation of the skin, cellular substance, muscles, &c., more frequently ends favourably than the same affection of bones, tendons, ligaments, &c. It is also more manageable by surgery; for those parts which

are not what anatomists term vascular, seem to enjoy only inferior powers of life; and this explains the difficulty of removing any inflammatary action that may arise in the tendons of the leg, which, from their whiteness, are not very vascular.

But inflammation of vital parts, though these may be exceedingly vascular, cannot go on so favourably as in other parts of resembling structure, but of different functions; because the mutual operations of universal health depend so much upon the sound condition of such organs. The truth of this observation is illustrated in cases of inflammation of the stomach or lungs, &c.

In strong constitutions, inflammation always proceeds more propitiously than in weak ones; for where there is much strength, there is considerable irritability. In weak-constitutioned horses, the operations of inflammation are backward, notwithstanding the part in which it is seated may, comparatively speaking, possess considerable organisation and powers of life.

Inflammation, wherever situated, is always most violent on that side of the point of inflammation which is next to the external surface of the body; and this is particularly exemplified in gun-shot wounds. Suppose a ball were to pass into the thigh, to within an inch of the opposite side of the limb, we should not find that inflammation would be excited along the track of the ball, but on the side next the skin which had not been hurt. If a ball should pass quite through a limb, and carry into the wound a piece of the saddle clothing, lodging in the middle, equidistant from the two orifices—which is not unfrequently the case in cavalry regiments—the skin immediately over the extraneous body would inflame, if the passage of the ball were superficial.

We see three very remarkable effects follow the prevalence of inflammation—viz., adhesions of parts of the body to each other, the formation of pus, or suppuration, and ulceration; a process in which the lymphatics are more concerned than the blood-vessels. Hence the terms *adhesive*, suppurative, and ulcerative inflammation.

All parts of the body, however, are not equally liable to each of the preceding consequences. In the cellular membrane, and in the circumscribed cavities—especially the cavity of the chest—the adhesive stage takes place more readily than in the others; suppuration may be said to follow next in order of frequency; and lastly, ulceration. Now, the ulcerative stage of inflammation most frequent in the horse, attacks the air-cells of the lungs, or the kidneys, but does not seem to affect, more than partially, any other *mucous membranes*. The suppurative inflammation comes on more readily than either the adhesive or the ulcerative stage. Adhesions, which originate from the slightest degree of inflammation in other situations and structures, can only be produced by a violent kind in the above-mentioned parts. Ulceration is more frequently met with upon mucous surfaces than adhesive ones.

The cellular membrane appears to be much more susceptible of the adhesive inflammation than the adipose, or fatty cells, and much more readily passes into suppuration. Thus, we see the cellular substance, connecting muscles together, and the adipose membrane to the muscles, inflaming, suppurating, and the matter separating the muscles from their lateral connections, and even the fat from the muscles, while the latter substance and the skin are only highly inflamed. But it must be allowed, that in situations where fat abounds, we very frequently meet with abscesses. This is so much the case, that fat has been accounted a more frequent nidus for the collection of matter, than the cellular substance. We have spoken above of the inflammation of the fats; but this is not an expression strictly true. Fat has no vessels, or principle of life, or action of its own; consequently, we cannot suppose it can either inflame or suppurate. We know that it is itself a secretion; and, when an abscess is formed in it, we understand that the mode of action in the vessels naturally destined to deposit fat, has been altered to that adapted to the formation of pus. When we speak of the fat being inflamed, we mean that the membranous cells in which it is contained, and by which it is secreted, are thus affected.

The deeply-situated parts of the body, more especially the vital ones, very readily admit of the adhesive stage of inflammation. The circumstance of deeply-seated parts not so readily

taking on the suppurative stage of inflammation, as the superficial ones do, is strikingly illustrated in cases of extraneous bodies; which, if deeply lodged, only produce the adhesive inflammation. By this process, a cyst is formed, in which they lie without any inconvenience; and they may even gradually change their situation without disturbing the parts through which they pass: but no sooner do these same bodies approach the skin, than abscesses immediately arise.

All inflammations, attendant with disease, partake of some specific quality, from which simple inflammation is entirely free.

When the constitution allows the true adhesive and suppurative stages to occur, it is to be regarded as the most healthy.

SYMPTOMS AND NATURE OF HEALTHY INFLAMMATION; PHLEGMON.

Swelling, heat, and pain are the principal symptoms of phlegmonous inflammation; and this term is usually applied to a circumscribed tumour. These are the first appearances observed in every case of phlegmon; and when they are slight, and the part affected is of no great extent, they have commonly very little, and sometimes no apparent, influence on the general system. But when they are more considerable, and the inflammation becomes extensive, the soft parts are more swelled than the harder ones.

Although all the symptoms of inflammation, such as swelling, throbbing, tension, may be less manifest when the affection is deeply situated, yet they certainly exist, as in poll-evil, fistulous withers, &c. Frequently, in horses dying of inflammation of the lungs, the air-cells of these organs are found crowded with a larger number of turgid blood-vessels than they have when in the healthy state. Coagulable lymph, and even blood, are extravasated in the substance of these viscera, which of course become heavier, and feel more solid.

The extravasation of coagulated lymph, which is one of the chief causes of the swelling, is also one of the most characteristic signs of phlegmonous inflammation. Common inflammation exists wherever the blood-vessels appear to be more numerous and enlarged than they are in a natural state, accompanied with an effusion of coagulating lymph, whether upon the surface of a membrane, or a bone, or in the interstices of the cellular substance, and attended with throbbing and acute pain in the part affected. Various causes produce inflammation.

REMOTE CAUSES.

The remote causes of inflammation are several in number, but very easy of comprehension, because only divisible into two general classes. The first includes all such agents as operate by their stimulative or chemical qualities—as, for instance, cantharides, large doses of aloes, heat, &c. The second class of causes are those which act mechanically; such as bruises, wounds, &c. After saying thus much, it seems quite unnecessary to give a detail of each particular remote cause.

One remote cause, however, and not the least singular, is *cold;* which appears to act in different ways. First, it may be applied in such a degree, and for such a length of time, as to destroy the vitality of the part directly, in which case sloughs are formed. In India this is a frequent occurrence with b th the horse and the native Indian. In the horse, it is called by the native *barsatee*, and is exceedingly troublesome to be healed. Likewise in the native, in the cold season, it is not uncommon for pieces to come out of the thighs (which are principally bare) as large as half-a-crown. In the horse, from the troublesome teasing of the flies, it becomes exceedingly annoying to the surgeon. Secondly, it may be applied in a less degree, or for a shorter time; and afterwards a stimulant, such as heat, may be applied, which will excite inflammation. The production of inflammation by any agent, depends, in a great degree, upon the suddenness of the operation of the agent which excites it; for a quantity of stimulus, which, if suddenly applied, would produce inflammation, may be applied slowly with impunity. Hence, every slight stimulant will produce inflammation and sloughing, in parts which have been weakened by cold. Thirdly, a part sympathises very much with the contiguous ones. If a part is weakened by having its action reduced, and if then the debilitating cause is removed, the action of the part will be increased from sympathy with the neighbouring parts. But, as the action ought to be very little, the power

being small, inflammation must arise from the action being increased beyond the power. We ought, therefore, in this case, to diminish the action of the neighbouring parts, in order to prevent an extension to a part which cannot bear the effect of it without becoming diseased.

PROXIMATE CAUSE.

Numerous opinions have been entertained upon this subject; but almost every theory has been built upon the supposition of there being some kind of obstruction in the inflamed parts.

While the circulation of the blood was unknown, and the hypothetical notions of the power of the liver, in preparing and sending forth the fluid, continued to prevail, it is not astonishing that the theories of so many writers should be imperfect.

It was formerly supposed that the liver was the centre of the vascular system, from which the blood went forth by day to the extremities, and returned again by night. If, then, any peccant matter irritated the liver, the blood was sent out more forcibly; and if, at the same time, any part of the body were weakened, or otherwise disposed to receive a greater quantity of fluid from the rest, then a swelling was produced by a flow of humours to this place. Fluxions, or flows of humour to a place might happen, either from weakness of the parts which allowed the humours to enter more abundantly, or from the place attracting the humours, in consequence of the application of heat, or other agents.

The ancient writers who suppose that the blood had very little motion, and that its course could easily be directed or changed, recommended heat to some part which was remote from a recent inflammation, by which they imagined that the current of blood was altered, and a revulsion made. A revulsion was also made by raising a tumour in some other part, or giving nature an opportunity of discharging the humours from distant parts, by applying blisters, &c. When blood was drawn from the vicinity of the fluxion, or congestion, the mode was called *derivation*, which only differed from *revulsion* in the distance to which the humour was drawn being less. Our present object is only to trace the leading doctrines which have at different times prevailed, as being the proximate cause of inflammation.

From the theories of fluxion and congestion, which were quite incompatible with the laws of circulation of the blood, we turn our attention to the doctrine of obstruction.

By some writers obstruction has been strongly advocated, attributing it to a viscidity of the blood, and also imagining it to occasion a resistance to the circulation in the part affected; hence, increasing it in the other vessels, proving an irritation to the heart, and augmenting the force or attraction of the blood in that part of the vessel which was behind the obstruction, causing heat and pain, and consequently an acrimonious state of the fluids, to be followed, in all probability, by gangrene.

The viscidity cannot be admitted as a proximate cause of inflammation, because we have no proof, say some authors, that this state ever exists; for, as they say, "Were a viscidity to occur, it would exist in the whole mass of blood alike, and could not be supposed to produce only a local disorder." This, however, is not true, for all parts are not so *susceptible* of taking disease as others; consequently, any poison producing inflammation that may have been taken into the system, may affect one part, and that only; and this from the *susceptibility* of the part.

As for the supposition of the co-operation of an acrimony of the fluids, the proportion of the saline matter of the blood has never been proved to be greater in this than in any other state of the body. Even were a general disorder of this kind to be admitted, no rational explanation of the proximate cause of local inflammation could be deduced from it.

According to the opinion of one of our best authors, inflammation is to be considered only as a disturbed state of parts which require to be restored to a natural mode of action. Inflammation in itself, therefore, is not to be considered as a disease, but as a salutary operation, the consequence either of some violence, or some disease. The same author further remarks, that the act of inflammation is to be considered as an increased action of the vessels; which action, at first, consists simply of an increase, or distension, beyond the natural size of these. This increase seems to depend on a diminution of the muscular power of the vessels; whilst, at the same time, the elastic power of the artery is to be dilated in the same

proportion. This is, therefore, something more than simply a common relaxation. The whole may be considered as a necessary operation of nature. Owing to this dilatation, there is a greater quantity of blood circulating in the part, which is in accordance with the common rules of the animal economy; for whenever a part has more to do than simply to support itself, the blood is there collected in a larger quantity; and nature never errs. The swelling is produced by an extravasation of coagulable lymph, with some serum; but the lymph differs from the common lymph, in consequence of passing through the inflamed vessels. It is this lymph which becomes the uniting medium of inflamed parts. Vessels shoot into it, and it has even the power of becoming vascular itself. The pain proceeds from spasm. When a part cannot be restored to health, after injury by inflammation alone, or by adhesion, then suppuration, as a preparatory step to the formation of granulations, and the restoration of the part, takes place.

An increased action of the vessels is now universally regarded as the proximate cause of inflammation. This opinion is greatly supported from a review of the several existing causes of the affection, which, being in general of an irritating nature, must, when applied to any living or sensitive parts, occasion a preternatural exertion of the vessels. The method of cure, as we shall presently show, tends also to confirm this doctrine with respect to the cause of inflammation.

SYMPTOMS OF INFLAMMATION FURTHER CONSIDERED.

The essential symptoms are swelling, heat, and pain.—*Swelling.*—This effect arises from several causes. First, from the increased quantity of blood in the vessels. Second, from the effusion of coagulating lymph and the deposition of a new matter. Third, from the interruption of the absorbents, or their incapacity to perform their office or functions.

Heat.—It was formerly imagined that heat was produced by the attraction of the red globules, of which blood is composed, against the sides of the vessels. Modern philosophy, however, teaches us, that a fluid may flow with the utmost velocity through a pipe, for a thousand years, without producing a single particle of heat. The most commonly received opinion now is, that the production of animal heat depends on the different degrees of power which arterial and venous blood have to combine with caloric; whilst in the minute arteries, the blood is combined with certain substances. In consequence of this, its capacity is diminished, and heat is given out. When the venous blood, however, has been freed from such substances in the lungs, its capacity is increased, and the heat which is given out by the decomposition of the air which we inhale, is absorbed. These facts show that the augmented heat of inflammation arises from the increased velocity of the circulation in the part affected. More blood is transmitted into the minute arteries; the capacity of a greater quantity of this fluid for heat is of course necessarily increased, and more caloric extracted.

Pain.—This is observed to be the greatest during the diastole of the arteries. The affection is probably owing to the unnatural state of the nerves, and not to mere distension, as many have asserted. Were the latter cause a real one, the pain would be proportioned to it.

THE BLOOD IN INFLAMMATION.

Blood, when taken out of the living vessels, spontaneously separates into two distinct parts; the *serum*, and the *crassamentum*. The latter is a compound substance, consisting chiefly of coagulating lymph and red globules, which are the heaviest ingredients in blood. Blood taken away from an animal affected with inflammation, is longer in coagulating, and coagulates more firmly than under any other circumstances. Hence, the red globules not being so soon commingled with the lymph, descend by their gravity; and being more or less divested of the red colouring matter, they are, from their appearance, termed the *buffy coat*, or *inflammatory crust*. The firmer and more compact coagulation of the lymph presses out an unusual quantity of serum from it, and the surface of the sizy blood is often formed into a hollow, the edges being drawn inward. These changes are, in some cases, a more infallible sign of the existence of inflammation, than the state of the pulse itself. At the same time, they are probably only a criterion of some unusual operation going on in the system. In peritoneal inflammation, the horse, sometimes, seems to

be in the most feeble state; and the pulse, abstractedly considered, would then rather induce the practitioner to employ tonics and stimulants, than evacuations; but should the continuance or exasperations of the disorder, or any other indication, lead to the use of the lancet, then the *buffy coat* and the *concave surface* of the blood, clear away all doubt concerning the existence of inflammation.

TERMINATION OF INFLAMMATION.

Inflammation is said to have three different terminations; or, in other language, after it has continued a certain time, it either subsides entirely, induces a disposition in the vessels to form pus, or completely destroys the vitality of the part.

When the inflammation is to end in the first-named manner, which is the most favourable, the pain becomes less, the swelling abates, and every other symptom gradually disappears, till at last, the part is wholly restored to its natural size. There is no formation of pus, or any permanent injury of structure. This termination of inflammation is termed *resolution*. It is fortunately the most common, as well as the most desirable manner in which the affection should end.

If, however, notwithstanding the application of the usual remedies, the several symptoms of heat, pain, &c., instead of diminishing, rather increase, and the tumour gradually acquires a larger size, becomes soft, and somewhat prominent in the middle, or towards its most depending part, the inflammation has ended in *suppuration*.

The worst, but happily the least frequent consequence of common inflammation, is the death or mortification of the part affected. The signs of this disastrous event are a change of colour in it, from being of a bright red, to a livid hue; small vessels, filled with a thin fœtid serum, arise on its surface, and air is plainly felt to exist in the disordered locality. The pain, indeed, is diminished, but the pulse sinks; while the tumour is gradually metamorphosed into a black fibrous mass.

These are the three most usual terminations of inflammation. By many writers, however, another disorder has been treated of, in which inflammation is apt to end—namely, *scirrhous*. But, although that complaint may, perhaps, in a few instances, follow inflammation, yet it is far from being a common consequence of it. Hence, although inflammatory affection may justly be mentioned as one of the many exciting causes of scirrhous, yet the consideration of this disorder can never with propriety be introduced into an account of inflammation.

Common inflammation, particularly when it affects glandular parts, is often observed to leave indurations behind it. Such indurations, however, are not at all malignant, and are very different in their nature from what is implied by a real scirrhous.

TREATMENT OF INFLAMMATION.

The grand principle to be observed in the treatment of inflammation, is to endeavour to lessen that immoderate action of the arteries, which is now commonly considered as the proximate cause.

The first circumstance to be attended to, in all cases in which resolution is to be attempted, is the removal of all such exciting causes of the disorder as may happen to present themselves. Foreign substances in wounds, frequently excite inflammation, and ought to be extracted as speedily as possible. A piece of bone, or a nail taken up in the foot, or even a thorn in the leg, often gives rise to the affection, and requires immediate removal. Such things as these may often be detected and removed at once; and this is doing a great deal towards the cure of the inflammation. Many of the exciting causes are only of momentary existence; yet, though they may no longer exist, the process of inflammation continues to follow the violence and irritation which were suddenly produced, and still remain. Hence, when taking away, if possible, the remote cause, it is proper, by other means, to *moderate* the increased action of the vessels.

If inflammation is consequent on an increased action of the vessels, and if a greater quantity of blood is impelled into, and circulates through the diseased part than is necessary in the natural state, it follows that *bleeding* must be a principal means of relieving it. The reason of this is, that it lessens the action of the whole arterial system, and, of course, of that part which is affected, and thereby diminishes the quantity of blood transmitted to the

part affected, by reducing the whole mass in the circulation.

Bleeding, however, is often misemployed, especially when regarded as the only remedy for this disease, and other steps are neglected. The obstinacy and vehemence of the process, in weak constitutions, prove that depletion is not invariably proper. When inflammation is combined with an unhealthy state of the alimentary canal, blood should be taken away with great caution. A great deal of induration, with little pain and heat in the inflamed part, the probability of a long and copious suppuration, and the dependence of the inflammation on local weakness, are particular instances in which phlebotomy should be sparingly employed. Bleeding is quite unnecessary when the disease is local, and symptomatic fever low.

On the other hand, bleeding is highly beneficial in all cases in which the disease is simple and uncomplicated, and attended with a high degree of febrile disturbance. Hence, inflammation of the eye, which is a most sensitive part, particularly requires a free evacuation of blood. Inflammation of the lungs, brain, or stomach, which are organs, the sound state of which is highly essential to the regular continuance of all the various operations in the animal machine, particularly demands the employment of the lancet; for, if a successful effort is not promptly made to stop such inflammation, death itself, in all probability, will be the result.

The sooner that bleeding is practised, the greater will be its efficacy, and the more rapidly the blood will be evacuated. *Bleeding* near the part affected is usually more effectual than when done in a remote situation. These remarks chiefly relate to *general* bleeding; but in local inflammation, topical bleeding is scarcely ever improper. It is always a point worth considering, whether bleeding *in or near the part*, will answer better than taking blood from the *general habit*; for less may be removed in this way, and the constitution not so much affected. Although, in many cases, the general habit may be relieved by bleeding, yet the part specially affected will always require this most. That local bleeding has a very considerable influence on the inflamed part, is proved by the sudden relief obtained from it.

The modes of performing local bleeding are by the lancet; or, if in the feet, by first removing the horn with the drawing-knife, and puncturing the vein with a strong abscess lancet; other parts, such as the thigh-vein, pastern, &c., are also bled with the lancet; the eye, likewise, with the small eye-lancet, the temporal artery, &c. But never bleed in the *jugular* or the plate-vein with any other instrument than the common phleme and blood-stick: but particularly the jugular; for should a misfortune happen with any other instrument, an action at law might be the consequence.

In continuation of the treatment for inflammation, the bowels must not be forgotten; and in exhibiting medicine in such cases, great care is necessary. The exhibition of small doses of aloes is good, or Glauber's salts, in the shape of draught, will be found very efficacious, and is a principal means of diminishing inflammation.

Direct purging is in nowise to be recommended; as it frequently ends in superpurgation and death. Saline medicines must lessen the quantity of circulating blood, inasmuch as they increase the secretion from the intestinal arteries. Hence they must operate beneficially in the cure of local inflammation, much upon the same principle as bleeding does. A very great authority and writer, was of opinion, that purging lowers action without diminishing strength; by which we are probably to understand, without producing a very lasting or permanent loss of strength. With respect to mild laxatives in inflammation, none are preferable to the above; but, of the two, the saline draught is preferable to the aloetic. We may here remark, that besides the benefit which the local inflammation derives from the judicious administration of purgatives, the costiveness and heat which usually attend the symptomatic fever, are also relieved by the same means.

Nauseating medicines, which have the power of producing sickness, lessen, for a time, the action, and even the general powers of life. This is in consequence of every part of the body sympathising with the stomach, and the effect may be very quickly excited. Sickness lowers the pulse, makes the small vessels contract, and rather disposes the skin to perspiration. But nothing more than nausea should

be caused. Nauseating medicines employed after bleeding once or twice, are often productive of considerable benefit; but there are some affections in which they cannot be used, such as inflammation of the stomach and intestines. In all superficial inflammations, however, they may be safely and advantageously exhibited, as well as in most internal inflammatory affections, especially in the lungs. Indeed, in every instance in which there is an urgent reason for putting a sudden check to the continuance of the affection, they may be used. The employment of nauseating doses of white hellebore or digitalis, to the amount of 1½ to 2 drachms, three or four times a day, is very efficacious.

Opium has been frequently recommended by many veterinary surgeons; and we have seen its good effects, especially in inflammation of the bowels. During its employment, the bowels should be kept open by clysters. Care must be taken to give it in sufficient doses; for small quantities not only fail in fulfilling the object, but frequently produce quite an opposite effect. It likewise occasions a moisture on the surface of the body, which experience shows is eminently serviceable in all inflammations. Opium, combined with aloes, is an excellent remedy in cases of inflammation of the feet; no person but such as may have used this drug, would believe the relief given to so painful a disease.

In all cases of inflammation, corn must be prohibited; and even when the inflammation is abated, great care must be taken in administering anything of a highly stimulating nature. Watery, cooling, mucilaginous drinks, taken in a lukewarm state, are the most proper, such as oatmeal gruel, and mashes of bran with chilled water. These take off heat, and tend to soothe the increased action of the whole arterial system. The stable in which the horse is kept, should not be warmer than his comfort requires; for, of all things, heat keeps up any increased action in the body in the most powerful manner. For the same reason, the animal should not be covered with a superfluous quantity of clothes.

The whole body, but more especially the inflamed part, should be preserved as free as possible from every kind of motion. Exercise, and muscular exertion of every kind, accelerate the circulation; and hence their pernicious effect on inflammation, by determining a larger quantity of blood to the part affected.

With the exception of what has been stated concerning topical bleeding, all the foregoing remarks relate to the general treatment of inflammation. We shall next consider its local effects.

It has been already observed, that inflammation is attended with an increase of heat in the part affected; and it is a well-known fact, that the action of the arteries, as well as any other action carried on in the animal economy, is promoted and increased by the influence of heat. For this reason, an obvious mode to be pursued is, to reduce the temperature of the inflamed part by the topical application of cold; and, in particular, by continually abstracting the heat generated in the part, by keeping up a constant evaporation from its surface.

Preparations of lead, and other sedative and astringent substances, are such as are in the greatest repute for bringing about the resolution of inflammation.

We have remarked, that cold applications used in the resolution of inflammation, are commonly such as are of an astringent and sedative quality; but the whole class of medicines which are found to possess these properties, can never be recommended as topical remedies for phlegmonous inflammation. The sulphate of zinc, and sugar of lead, combined with vinegar, are the only medicines of an astringent and sedative class, which seem to have acquired permanent celebrity for their efficacy in resolving inflammation.

Extensive experience, and long-established trials, have now fully confirmed the virtue of all local remedies, in which the sugar of lead is the active ingredient. The preparations of lead certainly merit the appellation of sedatives. An abatement of the different symptoms of pain and tension, and the communication of an agreeable soothing sensation to the part, are almost always the direct palpable effects. Every man of experience and observation will allow, that while there is a chance of accomplishing resolution, no local applications to phlegmonous inflammation are, in general, so proper as cold lotions, containing the acetate of lead.

Many objections have been raised against the lead lotion, from its poisonous quality, but, in inflamed parts, there is an impediment to absorption, and this circumstance may tend to render the employment of lead a matter of safety.

Sugar of lead, with vinegar and water, as follows, is the best method of applying it.

Sugar of Lead	4 drachms.
Dissolve in Vinegar . . .	4 oz.
Then add Water	2 lbs. (1 quart).

When not inclined to employ a solution of lead, try the sulphate of zinc. For this purpose, four drachms of this metallic salt is to be dissolved in a quart of water. Take a piece of linen, well wetted with the lotion, and apply it to the inflamed part.

Many persons ascribe very little real efficacy either to the acetate of lead, or sulphate of zinc, contained in the above applications; and they attribute all the good that is produced, entirely to the evaporation kept up from the surface of the inflamed part, and to the coldness of the fluid in which the metallic salts are dissolved. Those who entertain these sentiments, think the application of cold water alone, quite as efficacious as that of any medicated lotion whatever.

There are particular cases of inflammation in which the extravasation of blood and lymph into the interstices of the inflamed part is exceedingly copious, while the swelling is considerable, and the pain not particularly great. In such instances, it is a grand object to rouse the absorbents, in order to remove the extravasated fluid; and with this view, a more powerful discutient lotion than the Saturnine one should be employed Sometimes it is better to use embrocations and liniments, than any sort of lotion; and we have found it to succeed in general the best; and for this purpose recommend

Oil of Turpentine	3 oz.
Olive Oil	3 do.

Mix, and apply to the part.

Or, take

Mustard Oil.	4 oz.

Apply this alone, and it will be found very efficacious, especially if the disease is in the joints.

When the part affected is not very tender, or when it lies deep, applications of hot vinegar, or the Saturnine lotion, have been applied, but with little or no good effect. Alcohol and ether have acquired some celebrity as local remedies for inflammation. Perhaps one great reason why they are not more extensively used in this way, is the expense attending such treatment, as these fluids evaporate with great rapidity. Alcohol may possibly prove useful from its astringent qualities; but it seems much more rational to ascribe its virtue, as well as that of ether, to the powerful manner in which the evaporation of such fluids deprives the inflamed part of its heat.

WARM APPLICATIONS, EMOLLIENT POULTICES, AND FOMENTATIONS.

The absurdity of attempting to reconcile every useful practice with a philosophical theory, is, in no instance, more strikingly exemplified than in the opposite descriptions of local applications which are deemed of service in inflammation. The generality of cases undoubtedly receive most relief from the use of cold sedative astringent lotions; but there are constitutions and parts which derive most benefit from the local employment of warm emollient remedies.

Inflammations of the foot, broken knee, and strain of the back sinews, may be specified as examples in which, generally speaking, warm emollient applications are better than those which are cold and astringent. In all cases of inflammation, however, which manifestly cannot be cured without suppuration, the emollient plan of treatment ought to be at once adopted, as in either fistulous withers or poll-evil; for the sooner the matter is formed, the sooner the inflammation is stopped. The inflammation attending gun-shot wounds, is of this description; also, injuries received from the goring of cattle in the field, &c.

Warmth and moisture together, or, in other words, fomentations, are commonly had recourse to, in cases of inflammation; but when the warmth is as much as the sensitive principle can bear, it excites action. In many cases warmth does no good, and therefore it might be supposed to increase the action of dilatation, and do harm; but if the pain should arise from the contraction of the inflamed vessels, benefit would be the result, though we must doubt whether this change is produced,

as making the vessels contract would probably give ease.

In addition to what has been already observed, it seems almost impossible to give any useful practical advice, with respect to those cases in which warm emollient applications should be used in preference to cold astringent ones. The veterinary surgeon, however, who consults the feelings and comfort of the animal under his care, will seldom commit any serious error. Hence, in all cases in which the first kind of topical applications seem not to produce the wonted degree of relief, let the second sort be tried. From the opportunity of comparison, a correct judgment may then be easily formed.

Regarding poultices, the linseed meal should take the preference, and it is easily prepared. Put as much hot water into a basin as the size of the poultice requires; previous to which, mix the meal with cold water, so that it does not clot in lumps when brought into contact with the hot water; then gradually mix, till the mass is of a proper consistence. Very frequently, a little sweet oil or hog's lard is also added, to keep the application soft and moist for a longer time.

Fomentations are excellent; and in most cases of recent inflammation, as strains or bruises, nothing can be better. The benefit we have perceived from the application of warm fomentations, has been surprising.

By pursuing the treatment here recommended, the resolution of the inflammation will, in general, begin to take place, either in the course of three or four days, or in a shorter space of time. At all events, it may usually be known, before the expiration of this period, how the disorder will terminate. If the heat, pain, and other attendant symptoms abate, and especially if the tumour begins to decrease, it may then be considered almost a certainty, that, by a continuance of the same plan, a total resolution will, in time, be effected.

On the other hand, when all the different symptoms increase, and particularly when the tumour becomes larger and comparatively soft, attended with a more violent throbbing pain, it may then be concluded that the case will proceed to suppuration. Hence, an immediate change of treatment suggests itself; and such applications as were proper while resolution seemed practicable, are to be discontinued, and others substituted. This remark refers to the employment of cold astringent remedies, which, when suppuration is inevitable, only do harm, by retarding what cannot be avoided, and by affording no relief of the pain and other symptoms. If the inflammation, however, should be already treated with emollients, no alteration of the topical applications is requisite, in consequence of the inevitability of the formation of matter. Indeed, emollient poultices and fomentations are the *chief local means*, both of promoting suppuration, and of diminishing pain, violent throbbing, &c., which always precede this termination of inflammation.

When the system is too much reduced by the injudicious continuance of *the rigorous antiphlogistic treatment*, the progress of the ensuing suppuration is always retarded in a disadvantageous manner, and the animal becomes too weak to support either a long-continued, or a profuse discharge, which it may not be possible to avoid; but which should be especially noticed.

CHAPTER XXVI.

FEVERS.—FEVER IN GENERAL; INFLAMMATORY FEVER; COMMON FEVER; DISTEMPER, OR INFLUENZA; MALIGNANT FEVER; SYMPTOMATIC FEVER; CATARRH, OR COMMON COLD.

UNDER the head of *Fever in General*, we can only class inflammatory fever as belonging to the horse. It is particularly interesting to veterinary surgeons, as being the frequent

consequence of surgical operations, especially after firing or blistering.

This fever is known and distinguished by several names; some calling it inflammatory, some symptomatic, and others sympathetic. It is sometimes idiophatic; that is to say, it occasionally originates at the same time with the local inflammation, and from the same causes. In other instances—indeed, in all ordinary surgical cases—it is symptomatic, or, in other words, it is produced, not directly by the causes which originally produced the inflammation, but in consequence of the sympathy of the whole constitution from the disturbed state of the part.

The idiophatic inflammatory fever is said to be always preceded by chilliness. The symptomatic, or sympathetic inflammatory fever sometimes takes place so quickly, in consequence of the violence of the existing cause, or of the local inflammation, that no preceding coldness is observable.

If, however, the local inflammation is more slowly induced, and consequently operating more gradually on the system, then the coldness is evidently perceived.

The symptomatic fever induced by wounds or other injuries, is excited more slowly, and its period of formation is longer. This fever is not produced when the inflammation only affects parts in a slight degree, but it constantly makes its appearance if the local inflammation is considerable, or if it affects very sensitive parts.

The degree in which this fever is excited, does not altogether depend on the absolute quantity or violence of the inflammation, but, in a great measure, on the degree of local inflammatory action, compared with the natural power and action of the part affected. Parts, in which the action is naturally slow, are extremely painful when inflamed, and the system sympathises greatly with them. Hence the constitution is very much affected when *tendons, bones, or ligaments* are the parts inflamed. Severe inflammation of a large joint, every one knows, is apt to excite a most alarming, and even a fatal derangement of the system.

In common parts, as muscle, cellular membrane, skin, &c., the symptoms will be acute, the pulse strong and full, and the more so, if the inflammation be near the heart, but perhaps not so quick as when the part is far from it.

If the inflammation is in tendinous, ligamentous, or bony parts, the symptoms will be less acute. The stomach will sympathise more, the pulse will not be so full, but perhaps quicker; there will be more irritability, and the blood will not be so much pushed into the small vessels; and therefore it will forsake the skin.

It seems to be a material circumstance, that parts near to the heart, always exhibit symptoms more violent, and the constitution is more affected, than when parts are situated further from that source of circulation.

If the heart or lungs are inflamed, either immediately, or affected secondarily by sympathy, the disease produces more violent effects upon the constitution, than the same quantity of inflammation would produce, if the part affected was not a vital one, or one with which the vital parts did not sympathise. If the part is such as the vital ones readily sympathise with, then the sympathetic action of the latter will affect the constitution.

When the inflammation is situated in a part not very essential to life, and causes a general affection of the system, called inflammatory fever, the pulse is fuller and stronger than in general, and the blood is pushed further into the extreme arteries, than when the inflammation is in a vital part. The animal, after showing many occasional symptoms, is at first rather roused. The pulse is as described when the constitution is strong and not irritable; but if this is extremely irritable and weak, as in many animals it is, the pulse may be quick, hard, and small, at the commencement of the inflammation, just as if vital parts were affected. The blood also may be sizy, but it will be loose and flat on the surface.

The ordinary symptoms of inflammatory fever, accruing in consequence of local inflammation in common parts, are as follows: the pulse is frequent, full, and strong; all the secretions are diminished; the animal is restless; the perspiration is obstructed; the skin is dry and hot; the hair staring; the urine high-coloured, and made in small quantities; and the mouth hot and dry, attended with great thirst. These are the consequences.

TO RELIEVE INFLAMMATORY FEVER.

As the febrile disturbance of the system is produced, and entirely kept up, in almost every instance, by the local inflammation, it must be evident that the means employed for diminishing the exciting cause, are also the best for abating the constitutional effects. Hence, it very seldom happens that any particular measures are adopted expressly for the fever itself, as this affection is sure to subside in proportion to the local lessening or resolution of the inflammation. But when the febrile disturbance is considerable, and the inflammation itself is also considerable, the agitated state of the system may have, in its turn, a share in keeping up, and even in increasing the local affection, and should be quieted as much as possible. However, in these very instances, we should probably be led to a more rigorous adoption of the antiphlogistic plan of treatment, from an abstract consideration of the state of the local inflammation itself, without any reference to that of the constitution. Indeed, the increased action of the heart and arteries, and the suppression of the secretions, require the employment of antiphlogistic means, with alterative medicine, which will, in all probability, restore the animal in a few days.

But we think it right to repeat, that it is hardly ever necessary to have recourse to such an evacuation as *general bleeding*, merely on account *of the fever*, as this is only an effect, which invariably subsides in proportion as the local cause is diminished.

COMMON FEVER.

Common fever is a rare occurrence in the horse; but it is not so much its extreme rarity which renders its existence disputed, as that the constitutional tendencies of the animal are such as seldom allow general fever to prevail in him without a more active and local translation of the inflammation to some vital organ.

We have frequently met with this fever, and are convinced that many inflammations of vital organs begin by an attack not local, and confined to that immediate part, but by one which exists in the first instance, as a general, diffused, inflammatory action of the vascular system at large. Most veterinarians are aware, that it is a common practice, when a horse is observed at the very first approach of illness, to rouse him by several means. Among horse-dealers, especially, and other proprietors of horses, when disease occurs in the spring of the year, it is the custom to watch them narrowly, and to put some plan into practice of the above kind, immediately after which they frequently observe no more of the complaint. If, however, the first cold fit is passed over without attention, a hot stage generally succeeds. In due time the horse again shivers, his hair stares, and he becomes subjected to other symptoms of illness, and the disease is then fully formed. The means pursued for this end are various; but they are all such as tend to rouse the flagging powers, during the cold fit, into such a degree of increased action, as considerably to overbalance the augmented vascular action produced by the morbid attack, as shall be greater than the increased action of the complaint. It is upon justly appreciating the two degrees of action, and upon putting the forced one against the diseased one in sufficient strength, that the salutary effort consists. Were such a plan to be put into practice when a topical inflammation of some important and vital organ had actually taken place, it would, most undoubtedly, greatly aggravate it; but as in diffused inflammatory action constituting fever, there is a specific character not wholly dependent on the increase of the vascular power, so the production of an artificial action, greater than the diseased one in the earlier stage, will sometimes overcome the febrile one.

The causes of this fever are a plethoric state of the body in general, full feeding, with but little or no exercise, sudden alteration in diet, excessive fatigue, and great and rapid change in temperature. Long deprivation, likewise, from either food or water, particularly the former, may bring it on; but an alteration of cold to heat is certainly the most common of the existing causes, as well as of most of the inflammatory attacks of the horse. The vessels of the skin seem, in these cases, to be first acted on, and this from a sudden chill, in consequence of coming in contact with a cold atmosphere, producing those symptoms; first, a shivering fit, the skin shaking violently, the hair staring, the legs, ears, and muzzle feeling intensely cold. All these symptoms remain

according to the violence of the attack. The horse's mouth is generally found dry and hot, and he is seen frequently to lick his lips, as if he wished for some moisture. The skin is found alternately hot and cold, with occasional sweatings; the bowels rumble, and are flatulent, and he appears altogether uneasy, and seems more in want of a restorative than anything else, by which means the debility and fever would be carried off.

Such is usually the first stage of fever; but it is very common for it, at this period, to sink its specific character of true fever, into a local attack on some particular organ, as the brain, lungs, bowels, kidneys, and not unfrequently the feet. Under any of these circumstances, the primary character of fever is lost, and the remaining febrile symptoms become secondary and symptomatic.

The preference it may have in these instances for any one organ over another, is not easily accounted for; but it may be connected with local circumstances, particularly with such as have had a tendency to produce an unusual determination of blood to a part. Violent and long-continued exercise will induce a disposition to it in the lungs, from the very great quantity of blood forced through them during exertion. Water, if thrown over a horse when hot, is very apt, by checking perspiration, to bring on a state of the bowels, or of other viscera, predisposing them to inflammation.

A heavy and awkward rider, travelling a great distance, subjects the kidneys to such injury, that they often require but little additional stimulus to assume inflammation. It is equally notorious, that severe riding in the snow, or the custom of washing the feet when a horse is very hot, particularly in frosty weather, will produce, by reaction, a determination of blood to these parts, with a febrile irritation. The consequence of severe and injudicious management, may, by translation, be converted into acute founder, and such appears the origin of many acute founder cases. *The disease is then said to have settled in the horse's feet.* It remains to be noticed, that independent of these purely local attacks, there is great reason to believe that this fever not unfrequently degenerates into the catarrhal epidemic; for many cases which commence with a simple rigour, are often prevented from proceeding further by overcoming the first attack.

Should none of these attacks occur, however, but, on the contrary, should this fever remain, after the first stage, purely idiopathic (which is very seldom the case), it is invariably the same in any two subjects, although marked by sufficient general characters to describe them. The pulse loses fullness, but is hard, and increased in quickness.

What we have described, may be considered as constituting the principal stage of this fever, to which, under favourable circumstances, there succeeds a softer and less frequent pulse. The countenance looks more lively; and although the muscular weakness rather increases, the irritability lessens, the secretions also return to their natural state, the mouth feels cool and moist, and the heat of the body becomes gradually natural. Slight symptoms of returning appetite also appear, under which circumstances a resolution of the fever is formed.

For the treatment of simple fever, which generally comes on after a journey, the groom should immediately report the same the instant the cold fit or rigour comes on; then procure two or three men to work at the horse with dry straw with all their vigour, whilst he, in the meantime, is preparing the following draught:—

Good Ale (warmed) . . .	1 quart.
Ginger	½ oz.
Anise Seeds	½ do.

Give immediately; and after rubbing the animal well, clothe him warm, give him a good bed of clean straw, and bandage his legs up with flannel. Should the reader have one of the cordial balls, recommended in the list of medicines at the end of the first section of this work, take one and break it up, and dissolve it in the warm ale. If warm ale cannot be immediately procured, take half-a-pint of gin, and three half pints of water, to which add either the ginger or the cordial ball. On the morrow give the following alterative:—

Cape Aloes	2 drachms.
Juniper Berries	1 do.

Form into a ball with soft soap, and sufficient linseed meal.

After this feed the horse as usual. He will be fit for work in two days' time.

The distemper, or influenza in horses, attacks them at all seasons of the year, and under almost any circumstances; but it is infinitely more prevalent at some times, and under some circumstances, than at others. This is especially the case in the spring, near the sea-coast, and when the wind is blowing off the sea from the south-east. This has been demonstrably proved. No age is exempt from this disease. In large towns, horses are very liable to it, particularly if their heads are fastened in a south-east direction, and the rack at the top left completely open. Occasionally, however, it rages in a truly epidemic form, when the liability to its attack is almost uniform among all varieties, with the exception that, even under this state, young animals, and those newly brought into stable management, are more liable to it than older ones. The spring appears to be the time of year when they are most subject to this disease, the prevalence of which is materially increased by the variable state of the atmosphere, as in great and sudden changes from dry to wet, and from heat to cold, and still more certainly if these are accompanied with an easterly wind. Now and then it is found to occur in wet autumns also. It has been disputed whether it is contagious; but on this point we do not think it difficult to decide, for we have seen a number of horses stabled together, and some of them not the least affected, while others, standing near them, have suffered greatly from an attack. This can only be attributed to the susceptibility of the constitution of some to be affected by the disease more readily than others, though it may appear to exhibit all the characteristics of contagion.

Many foreign writers have fallen into the same error with some of our English veterinarians, and confounded this disease with pereemonia, and other diseases of the chest. This mistake is not to be wondered at in practitioners of moderate experience, from the circumstance of these diseases possessing some symptoms in common, and, in fact, from itself frequently terminating in that complaint; but this is to be attributed more to unskilful treatment than to a disposition of the disease, in itself, to such a result; for, in a sea-coast practice, we could count, in one year, three hundred cases in which not a single patient was lost.

The first indication of the disease is a loss of appetite. The horse looks dull and heavy; his legs and ears are cold; his mouth warm and dry; and he frequently attempts to blow his nose, from which comes a purulent discharge, and he breathes rather hard. The *parotid glands* under his ear, and extending to the angle of the jaw, are much swollen. Sometimes the *submaxillary gland*, between the jaws, become swollen, but not frequently. His ears continue cold, and he coughs dreadfully; the violence would almost lead to the belief that some important organ would be ruptured. This continues sometimes for three or four minutes, with such distressing violence to the horse, that it pains the observer. Sore throat is always an attendant on inflammation of the tonsils. The animal cannot swallow his drink but with such difficulty as rather to resemble sucking than swallowing; if he is inclined to eat, the hay is quidded, and returned again, from an incapability of passing it over the *glottis*. Sometimes the inflammation proceeds down the windpipe, and then the cough is extreme. It is also sore to the touch on the outside of the throat. Indeed, in some cases, the horse evinces great restiveness when the hand is laid on his throat, on the enlarged glands, or the windpipe. In some cases the discharge from the nostrils becomes of a mucous character; but this is a favourable omen.

The causes of this disease, as before described, are principally dependent on a variable atmosphere, acting upon a peculiar aptitude in the constitution of the horse to become affected. In some years, this aptitude is more general than in others; and if an unusually variable temperature takes place in the climate, with atmospheric moisture, the disease assumes a more epidemic type.

In treating for it, the animal must never be bled; for, what is this distemper?—nothing more than *sore throat*, which may extend as before described; but, then, bleeding is bad, because no vital organ is affected. Remove the soreness from the throat, and the animal gets well. The very fact of the horse having a difficulty of swallowing, proves that the distemper extends little or no farther than the *rima* and *epiglottis*, the membranes of which

are of such a delicate nature, that certain atmospherical changes will affect them. The means of cure are so exceedingly simple, that it almost doubly strengthens this fact. Use the following receipt, which will seldom, if ever, be found to fail:—

Glauber Salts	4 oz.
Linseed Meal	2 do.

Let these be well mixed with two quarts of hot water; and when of a proper heat, let them be carefully horned down. Repeat them night and morning.

This draught will lower the inflammatory action that may be going on in the system, and the horse's mouth will get gradually cool, and everything in the shape of fever leave him.

In such cases of this distemper, the attempt to give a ball cannot be made, for the soreness of the horse's throat will prevent him from swallowing it. Let warm water, or chilled water, in which a handful of oatmeal has been mixed, be placed in his manger, so that he may indulge in it should he think proper. If his bowels should at all appear costive, back-rake, and give two or three clysters, until there are evident signs of a relaxation of the bowels. If the horse should make frequent efforts to blow his nose, without discharging anything, apply a nose-bag made of coarse cloth, with a portion of scalded bran in it to steam his head. This will produce the desired discharge, and you may rest satisfied that he is progressing towards a better state. Bandage his legs, and dress him well; give him good warm bedding, and prevent, as far as possible, all draughts from entering the stable. For food, bran mashes will be the best thing, but only in small quantities, *and cold*, for he will not eat much until the soreness of his throat is removed. If large quantities are given at once, and the discharge from the nose becomes copious, he will refuse his food afterwards. Horses will scarcely touch warm bran mashes at any time of the disease. Therefore, if a few vetches or grass can be procured for him, he will be most likely to eat them. To remove the soreness of the throat, make use of counter-irritants; the best of which is composed of the following ingredients:—

Oil of Turpentine	3 oz.
Olive Oil	3 do.

Mix, and rub this liniment all round the throat, on the swelled glands; and if the disease should have been of some days' standing, rub on about half-way down the neck, as far as the windpipe can be felt. Should this liniment not be found sufficiently strong, take of

Mild Blistering Liquid	4 oz.

and apply to the parts, morning and night. (See *List of Medicines.*)

In consequence of the difficulty of swallowing, and the consequent debility arising from the want of proper nourishment, the horse naturally becomes weak, and requires art to assist nature, after all febrile symptoms are gone, which will easily be ascertained by the recovery of his appetite, the coolness of his mouth, and his spirits being greatly enlivened. At this time you may venture to give him the following tonic ball:—

Sulphate of Iron	12 drachms.
Aloes, Cape	6 do.
Gentian	12 do.

Mix, and form into a mass with honey.

Divide into six balls, and give one every morning.

In proceeding as before described, no fear need be entertained as to success in curing the distemper, no matter in what shape it may have made its appearance.

MALIGNANT FEVER.

Malignant or putrid fever in horses is of rare occurrence; and when it does occur, it is generally a sequel of the distemper just described; principally arising from the debilitated state to which the animal is brought by *too much bleeding* for that disease. The system is consequently so much lowered from its natural standard, that the disease may take on a putrid or typhus form. When the disease, from improper treatment, is allowed to arrive at this state, it then may, in some measure, be said to become infectious, but not in any other form of the disease.

The malignant epidemic of horses always commences by similar appearances to those which characterise the mild epidemic. In fact, the one is only a heightened degree of the other, pushed into a putrid type; not by the violence of its action, as supposed by some, but by reducing the arterial system below its proper standard. Another proof of this

debility existing in the malignant kind, is seen in the purging which is usually present, and a fœtid, stinking discharge from the nose also. The breath is likewise particularly disagreeable, and the pulse quick and small, attended with extreme weakness.

In treating of malignant epidemic, it is hardly necessary to say anything about bleeding, as *that* may be considered the principal cause of the disease. As soon as any appearances of malignity present themselves, the most active means must be employed to support the strength, rouse the action of the system, and destroy the putrid tendency. For the accomplishment of this, take a nose-bag, and fill half-full with bran; then take

Chloride of Lime	2 oz.
Water (warm)	1 gallon.

Moisten the bran with this liquid, and put the bag on the horse's head, that he may inhale the chloride, which will remove the putrid tendency. Care must be taken not to have the water too hot. Repeat three or four times a day, for about half-an-hour each time. Give malt mashes, and nutritious glysters, either of rice-water or starch, and administer the following ball:—

Cantharides	5 grains.
Arsenic	5 do.
Sulphate of Iron . . .	2 drachms.
Aloes, Cape	1 do.
Juniper Berries . . .	1 do.

Let these be well incorporated with honey, and given every morning, or every second morning. By this method of treatment a successful termination of the disease may be anticipated.

SYMPTOMATIC FEVER.

A symptomatic fever is a degree of inflammation and increased circulation, occasioned by some distinct or local pain, and is not a disorder within itself; but probably the effect of, and dependent on, some other disease for its being produced. This fever is so influenced by the cause, and so entirely regulated by its changes, either for better or worse, as to be constantly reduced to an alleviation of the original complaint, and totally dispelled by a removal of the disease to which it is a concomitant. The fever being only a symptom of some other, the mere effect of preternatural heat excited by extreme pain, and not a distinct disease, let the original cause be removed, and, as a matter of course, the effect will cease.

It has been repeatedly urged by authors of great repute, that every fever is one and the same disorder, only appearing differently, according to the various circumstances it meets with in different constitutions; and much might be advanced in favour of this assertion. For want of due attention to the difference of stages, many fine horses have been hastily condemned. Persons should not only be accurately nice in the discrimination of disease, but, by attending minutely to circumstances, endeavour to develop the indications of nature, and strengthen all her efforts. In such cases, no person can be too well acquainted with the qualities of medicines, or with what is to be expected from their effects; and should have in view, on every emergency, their operations, whether certain or probable relief is to be obtained. These ends should be promoted by every fair and gentle means which circumstances may justify, or discretion dictate.

Symptomatic fever is most frequently brought on by a general cutaneous obstruction, or sudden constriction of the pores of the skin, which will constitute the foundation of every fever to which the animal can possibly be subject. Inflamed feet will produce it; tumours of almost all descriptions; even nailing a shoe on too tight will produce symptomatic fever; besides wounds, and almost all operations that are attended with severity, blisters, &c.

With respect to symptoms, the most certain of these are, a universal heat, and disordered pulse; a palpable disquietude and uneasiness, shifting from place to place. The horse labours under difficult respiration; his mouth is very dry, his tongue parched and hot; he declines his food, but will drink water; and sometimes seizes his provender with seeming eagerness, then drops it in disappointment. The body is generally costive; and in the early stage of disease, there is a slight proportion of obstruction of urine.

Let a fever proceed from whatever cause, the modes of cure are still the same; such as diminishing the preternatural heat to that degree which constitutes its healthy state.

Remove all internal obstructions; and by a proper and judicious administration of medicines, calculated to subdue the original cause, all dependent symptoms will certainly subside. For this purpose administer emollient clysters, after having back-raked the horse, so that easy evacuations may be promoted, and give

Digitalis . . . from 1½ to 2 drachms
Aloes, Cape . . . . . 1 do.
Make into a ball, with soft soap.

Administer one every morning, which will lower the action of the heart and arteries, and entirely remove their inflammatory action: or give the saline draught, as prescribed. (See *List of Medicines*). Give nitre, about an ounce in the horse's water every night; feed with bran mashes, or green food, if it can be provided fresh; if not, a few sliced carrots mixed with his mash, and a handful of oats, will entice him to eat, and prevent that considerable debility which frequently arises from symptomatic fever. Have his legs well rubbed, and moderately clothed, and let him be well littered down with clean dry straw.

CATARRH, OR COMMON COLD.

Catarrh, or common cold, is one of the most frequent attacks of fever to which the horse is subject. Cold, indeed, is an indefinite name for catarrh, which consists in an inflammation of the *rima glottis*, or top of the windpipe, which is covered with a highly sensitive membrane, even more sensitive than the nerve itself.

This is the seat of catarrh and cough; and when it is affected, the horse is said to have caught cold. This expression, however, is apt to mislead from the true nature of the real cause; for this cold defines no particular degree in which it has been caught. The truth is, it is the change from one degree of temperature to another, the warm air acting as a stimulus, and the cold as a sedative; and thus people, without reflection, attribute the attack to catching cold. Horses are necessarily exposed to these variations of temperature many times a day; and this is demonstrated particularly in man, without going to individual cases, but to numbers; for, in removing a whole regiment from comfortable barracks to open camp, cold operates, but no catarrh; but on again returning to barracks, which produces the effect of high temperature, catarrh becomes common; and it is a known fact, that deaths are never so few as in the open field.

Horses that are kept in the open field in winter, are not attacked with catarrh, inflamed lungs, grease, &c.; but when brought into the stable, catarrh immediately makes its appearance. This sudden change cannot be referred to simple heat, but to a poisoned atmosphere, which is generated in stables, breathed many times over; nature not having intended animals to breathe the same air a second time. The closer we adhere to her laws, the less probability is there of disease.

Horses will certainly lose flesh by being kept in cold fields; for animal oil wants a certain temperature for its increase. Horse-dealers are well aware of this in preparing their animals for sale. By these facts, different changes are proved; hence badly-constructed stables, and contaminated air, are the veterinary surgeon's best friends.

Thus, then, taking cold is, properly speaking, taking heat, the disease being of an inflammatory nature.

Catarrh being proved to be an inflammation, originating in congestion, cold cannot possibly produce this, but the direct contrary. This may be proved by bringing a frozen animal to the fire, by which means you excite inflammation, and destroy him; but if you rub him with snow, he revives, because the snow, with friction, is warmer than the body, and becomes of a sufficient degree of heat. But the idea that cold produces catarrh, arises from its existing mostly in cold weather; but what the cold does is this—it renders *the parts more susceptible of heat.* Persons may ask, why are the cartilages of the windpipe more particularly affected? The answer is, that they have been made thus sensitive as a kind of safeguard to the lungs; and when we consider that, in bringing horses into stables, *it is from cold to heat, and from a pure to an impure atmosphere*—this being more than a simple change—the question then arises, how are we to prevent it? We must acknowledge that all animals fatten sooner in a warm temperature than in one of the reverse; but then the change must be gradual, being mindful that the air all this time should be pure; for the

diseases of horses may almost all be referred to ignorance and neglect; and, in the same manner, this will, to a very large extent, apply to all animal creation.

As it is necessary to have horses stabled, for our many frequent uses, pure air has as much to do with the prevention of catarrh, as anything else; for a poisoned atmosphere produces more or less effect upon all animals, in accordance with their habits. We, ourselves, are born in a comparatively impure atmosphere, and brought up in it; but use with us is second nature. A horse, on the contrary, comes into the world in a pure atmosphere, never breathing the same air twice. Therefore the opposite must take greater effect on horses than on us; and hence we seldom see them ill until they are brought into stables. Then the horse becomes sick, and the owner is surprised; but it ought to be a greater surprise that the animal should live at all. Although no advocate for cold stables, yet we are no friend to such as are heated by dung and urine.

Horses generally become diseased during the night, the impure air then collecting; for during the day there is a partial ventilation. Most persons on visiting a stable the first thing in the morning, are well aware of the effect of the air on their eyes.

Common catarrh often takes a great hold of the constitution; the irritation causing cough, and not unfrequently ending in chronic cough, from the irritability of the nerves, occasioned by the previous attack. If the inflammation attacks the membrane which lines the nose, a discharge will be the consequence, sometimes from one or both nostrils; nature endeavouring, by this means, to relieve herself. This inflammation frequently, or almost always, affects horses coming into large towns. Horse-dealers are well aware of this, and often try to prevent it, by turning them into a loose place, for the attack seldom or ever comes on whilst they are on the road in exercise, and breathing pure air. Mistaken kindness will often permit them to rest when the journey is over; but, however much the horse may have travelled, he should have walking exercise the next day. The first few days are of the greatest consequence.

The cause of catarrh, according to the doctrine laid down at the Royal Veterinary College, is common cold; but other causes will produce the same effects, and deserve great attention from every possessor of horses. What is called cold, may arise not only from breathing impure air in stables, but from the real *application of cold*, when the animal is in an excited state, or in a state of perspiration, and allowed to stand in a draught of air.

In this, as in many other diseases to which the horse is subject, cold acts differently upon different constitutions; the injury sustained being in some respects regulated by the degree of heat, or perspiration, in which the animal was at the time of his being exposed to the original cause, from which some idea may be formed of its probable duration and severity. The effects of cold are not only soon discovered where there is constant attention and care, but an observation may be very early made on what part it more immediately directs its attack. In all cases, either of the eyes, throat, or the head, it will discover itself, more or less, in a cough, or in an obstruction in breathing, according to the severity of the attack. So soon as a horse is in this state, a symptomatic fever attends, which is to be understood as a degree of febrile heat, or irritability, dependent on the original cause, and which gradually ceases as the primary disease is found to decline.

In treating for this, bleed moderately, say two or three quarts—not enough to debilitate the animal; that is, according to his size, state, and condition. In about three hours give him a bran mash, having first removed all his hay out of the rack. Mix an ounce of nitre with his water morning and night. Continue this treatment for two or three days, giving occasionally a handful of sweet hay, *wetted*. This, in many cases, when taken in the early stage, will prove successful. Should this treatment not produce the desired effect in the early stages, and should the attack have been neglected, and the disorder have made rapid progress; should the cough be violent and constant, the horse very dull and heavy, declining all kind of food, and the symptomatic fever running high; perhaps the disease will not immediately submit to the above treatment so soon as may be wished or expected; therefore repeat the bleeding in two or three days at farthest, according to the state and necessity, altering

the mashes to equal parts of malt and bran, scalded with boiling water. When nearly cool enough for the manger, stir in it—

Glauber Salts	2 oz.
Liquorice, powdered	1 do.

Let this be repeated every night and morning, continuing the noonday feed dry, and the nitre as before. Good grooming and gentle exercise must not be neglected.

It should be remembered, that cough, or colds, thus treated, before they have been suffered by neglect or penury to become obdurate by long standing, generally submit to a very small degree of trouble or expense; whilst tardiness in procuring expeditious relief, is often productive of evils that no future assiduity can relieve. A critical discharge at the nostrils may come on, which may terminate either in *chronic cough*, *broken wind*, *inflamed lungs*, or even in *glanders*. To obviate these misfortunes, if they do occur, give a dozen of the following balls, not neglecting the nitre in the water:—

Turkey Figs	4 oz.
Liquorice, powdered	4 do.
Aniseed	4 do.
Ginger	1 do.
Caraway Seed, powdered	1 do.

Honey sufficient to form into a mass.

Divide into eighteen balls, and give one every morning.

To say precisely in what time the cure will be completed, is impossible; but this method of treatment is strongly recommended.

The treatment for cough, at the Royal Veterinary College, is—

Cape Aloes	1 drachm.
Linseed Meal, about	2 do.

Soft soap to form the ball.

Give one every morning. Sometimes a dram of digitalis is combined with the above.

CHAPTER XXVII.

COUGHS; ROARING; CHRONIC COUGH; THICK WIND; BROKEN WIND.

ROARING.

THE horse is very subject to this disease, especially carriage-horses, and particularly those of the Yorkshire breed, whose fine upstanding height, of from sixteen to eighteen hands, and their long necks, cause them to be sought after in London for the carriage. In driving them, the coachman is enabled to shorten his bearing-rein to any length he thinks proper, and thereby bring his horses' necks into a beautiful curve. This is done to exhibit them in style, or what these knights of the whip call, bringing them out in form, though, by such means, the disease called *roaring* is produced. In many cases where this disease exists, it is exceedingly unpleasant to hear the noise the horse makes every time he breathes; indeed, in some cases, it is so distressing, that from exertion the animal will fall; yet, this tight bearing-rein must be used. Let us here, however, explain what it is that principally is the cause of this complaint.

Roaring is occasioned by anything that obstructs the air-passages, or, in other words, anything that impedes the air from passing up and down from and to the lungs. Inflammation of the fine secreting membrane which lines the windpipe, will frequently produce it, from an alteration of the arterial action, by which an effusion of coagulable matter may be thrown out, and become organised, and, in consequence, remain as a permanent obstruction to the passage. Inflammation of the lungs will also sometimes occasion it; strangles also will, by producing general inflammation round the throat, frequently cause it. But the most painful cause of roaring is, the *tight* reining-in of carriage-horses, by which the windpipe becomes distorted, or, in other words, contracted and diseased. The horse, in his natural state,

feeds off the ground; consequently, his neck is at full stretch; but when he becomes domesticated, this natural stretch of it is removed from him, for he has his rack level with his head, and the manger but little lower, so that those muscles of the throat, connecting the windpipe with the *spur-bone*, as it is sometimes called, and the inner sides of the posterior part of the jaw, become, in a manner, useless; consequently, contraction takes place; and as nature finds but little or no use for them in such a case, so absorption takes place, and they become shortened. It is from this cause that we frequently see cart-horses, when turned out to grass for a few hours, spread their fore legs so extraordinarily wide. This is the natural consequence of their not being able to reach the ground from the contraction and absorption of a portion of these muscles.

Another cause, and, perhaps, the principal cause of roaring, is the partial absorption, or lapping over of the *ligamentous cartilego* union existing between each ring of the windpipe, from the horse's head being so bridled in by the bearing rein. (See *Plate*). It has been remarked by a very eminent practitioner, and one particularly so at the Royal Veterinary College, that the throat-strap being buckled too tight may be the cause; but, if this were the case, not one out of every cart or waggon horse would escape, especially when we take into consideration the heavy harness with which they are appointed; but this is not the case with carriage or saddle horses, the harness of which is of the lightest description, and especially at the present day.

In treating for roaring, we must premise that its cure is very difficult, indeed not practicable. It may, however, be prevented; and, as "a preventive is better than a cure," we will endeavour to describe how this is to be accomplished. In the first place, the rack out of which the horse eats his hay should be altered. It should be on the ground, so that the horse's neck shall be on the full stretch, or as it is in a state of nature when in the act of cropping his food. By this means, those ligamentous attachments of the rings of the windpipe would become elongated, or be kept in their natural situation. That corrugation of the membrane, which might, under other circumstances, become thickened, would be removed, and so prevent a contraction or reduction of the compass of the air-passage, by which the unpleasant noise of roaring is produced. Nature never intended a horse to have his hay just opposite his nose. All horses in India feed off the ground, and it is a rare thing to meet with a roarer there.

CHRONIC COUGH.

Chronic cough consists in a violent action of the diaphragm, and the abdominal muscles producing a forcible expiration of the air from the chest, ejected with much violence, with the intent of removing any extraneous body that may intercept the passage of the air. Whenever it accompanies a general affection of the constitution, it most frequently assumes the chronic form. Catarrh, and inflammation of the lungs, are usually attended with cough; and even if those diseases are removed, chronic cough supervenes. It is, also, a very common attendant of thick wind, broken wind, glanders, and pulmonary consumption. Worms also will produce coughs. It also exists, at times, without any attendant difficulty of breathing, the horse eating well, and appearing in good condition Sometimes a chronic or permanent cough appears to affect the animal when going to stable in the morning, or at the different feeding times. This is in consequence of admitting the cold air into the stable, which becomes a source of irritation to the air-passages. It is no uncommon thing for horses, on first going out to exercise, to cough; but this is in consequence of coming in contact with cold air. A cough of this description is very common, and will sometimes affect the horse for years, yea, even his whole life. In other instances it does not end in so harmless a manner; but, upon any occasional cold taken, becomes aggravated; and when this repeatedly occurs, the bronchiæ become so permanently affected, that chronic cough is established.

The effects and termination of chronic cough are dependent in a considerable degree upon the causes producing it. From what we have observed of the termination of inflammation of the lungs, it will be easily seen that an irritation often remains in the air-passages after that disease, as well as in some cases of catarrhal affections. In either of these cases,

any change of atmosphere excites these excessively irritable parts into action; making the horse cough whenever he is moved in or out of the stable; for the air being either hotter or colder than what was before breathed in the regular way, becomes a source of irritation. Drinking cold water will, from the same reason, produce the same effect for a time, if given in the stable; but if a horse is allowed to drink at a pond, where the water is of the same temperature as the atmosphere, no ill effects will result. Any irregularity of motion or hurry in the pace of the animal will produce this cough; and in some cases, it is continued to such a length of time, as to be truly distressing. There are instances in which the irritability of the bronchial membrane itself, does not seem so much increased as to alter either the quantity or quality of the mucus secreted. It may become inordinate in quantity, where horses, when they cough, discharge it at the nose, or it may be more acrid in quality; but, in either case, it proves a source of continual irritation. In some cases, the deposit of adhesive matter in the air-passages, arising from catarrhal inflammation or inflamed lungs, will produce chronic cough, and the deposit will then cause irritation. This deposit of lymph-like matter is sometimes removed by the violence of the cough; and by administering expectorants, a separation is frequently obtained, when great quantities of this obstructive matter is brought up. In some constitutions, a large portion of it becomes absorbed, and this may be assisted to a great extent by administering proper medicines.

The remedies for chronic cough are applied in accordance with the symptoms it exhibits; and when it appears from a want of mucous secretion, we know of no medicine so effective as the ball prescribed in catarrh. On the other hand, if the mucous secretion should flow in such quantities as to cause the horse to be weakened by it, then it will be proper to administer the following:—

Sulphate of Iron	2 drachms.
Gentian	2 do.
Aloes	1 do.

Honey to form the ball.

One of these balls to be given daily.

If the secretion should be of an acrid, watery description, a course of mercurial medicine should be tried, being careful, at the same time, that the animal does not get a chill during the time this medicine is being given him. The following is recommended as good:—

Blue Pill	2 drachms.
Ginger	1 do.

Form into a ball, with soft soap.

Give one of these balls every second day for a fortnight. If the horse should reject his food in the course of the exhibition of the medicine, desist from giving it for a few days, and commence again. This we have known to remove very severe attacks of chronic cough, and frequently, when attended with worms, when the coat was staring and dry, and the stools fœtid and slimy.

In chronic cough, great attention should be paid to the food of the animal—never to give clover. It is heating, and altogether unfit for horses so affected. Chaff, also, is not to be recommended in this disease. Good sweet oats and hay, both made a little damp, will be found the best. Carrots, occasionally, are excellent; so also are a few Swede turnips; or even a few potatoes cut up will afford great relief. Occasionally, bran mashes, with a little scalded linseed, will also prove useful.

In cases of chronic cough, where it appears of an aggravated nature, insert a rowel in the chest, and dress with the digestive ointment. (See *Ointments*, in the medicinal part of this section). Keep the rowel in for at least a fortnight. Should the cough be very severe, apply the following liniment to the whole length of the horse's windpipe night and morning.

No. 1.

Oil of Turpentine	3 oz.
Olive Oil	3 do.

Apply as above directed.

Or, No. 2.

Cantharides	1 oz.
Olive Oil	5 do.

Let these remain in a bottle for about six days, occasionally shaking it, and then apply as above directed. In cases of coagulable lymph being deposited in the windpipe, these liniments will greatly tend to remove it.

THICK WIND.

This disease is generally the sequel to inflamed lungs, which has thickened the air-

passages, and consequently prevented a free and unimpeded respiration. It is a disease rarely occurring of itself, but supervening after some other inflammatory attack to which the air-passages may have been subject, such as catarrh, &c. Long-continued exercise, quickened beyond the capacity of the lungs to bear, is frequently a cause; and such is particularly the case when horses are driven or ridden hard with full stomachs. It is also not unfrequently produced when horses are too fat, or, in other words, out of condition, when inflammation is superinduced in the air-passages. Confinement will frequently produce it, by exciting an inflammatory diathesis, especially if over-feeding, with a want of exercise, be added to it.

The remote causes of thick wind are to be found in morbid vascular action. The proximate causes are more obscure; but the examination of morbid subjects, in most instances, shows some disorganisation in the structure of the lungs. A deranged state of the lungs, and especially if the atmosphere is at all thick and heavy, will give rise to it. The most usual appearance it presents, is a morbid alteration in the minute bronchial ramifications of the blood-vessels, occasioned either by a thickening of their own membranous structure, or by a deposit within them of coagulable lymph, which, necessarily, contracts or lessens their functional capacity, rendering air-passages much smaller than they are in a natural state, when difficulty of respiration is produced, and the animal is called foggy, or thick-winded.

Thick wind is easily discovered by any person at all acquainted with horses. A sense of fulness in the right side of the heart induces the animal to respire hastily. The force with which this is done occasions the sound so well known as the distinguishing mark of thick wind, which often degenerates into, what is called, broken wind.

For the treatment of thick wind, there is no better remedy than the *cordial pectoral ball*, given in the list of medicines at the end of this section, administered occasionally in the morning, when the affection appears, more than usual, to distress the animal, and rendering him apparently less capable for the performance of his duties.

BROKEN WIND.

This affection of the lungs and air-passages has a long time puzzled both English as well as French writers on veterinary subjects, but without either being satisfied, until the all-penetrating genius of Professor Coleman, of the Royal Veterinary College, threw a light on the subject before unknown. The theory of that gentleman is a correct one. He discovered it to be a rupture of the air-cells of the lungs, so that the thin membrane covering these, becomes raised up in small bladders, wherever the rupture takes place. This opinion has been thoroughly proved, on examination after death, in such subjects as had been affected with the complaint when living. The alteration in the structure of the broken-winded lung is in general very considerable. It has been asserted that, in very few instances, no change whatever has been detected, and the lungs have presented little or no morbid appearance; but this we should very much doubt, having dissected several horses affected with broken wind, and having examined their lungs minutely, and always found great derangement in them. The alteration consists principally in an emphysematous state, dependent on the air, as above stated, being extravasated not only throughout the parenchyma in minute air-bubbles, but also extended over the thin membranous covering. This extravasation is, in most cases, so complete, as to render the lungs specifically lighter than ordinary, and to make them crepitate and crackle under the hand. They are also, in every instance, of a paler colour.

The invariable presence of emphysema in such cases being fully established, it is not to be wondered at that a cure has never been established for broken wind. Some writers have said that there may be a possibility of cure, but without making mention of the curative means. We shall, therefore, offer our opinion as to the best means of relieving the disease, without making any pretensions to the discovery of a perfect remedy.

Where broken wind exists, it is easily known by the peculiar action occasioned by the respiration of the horse. The cough, also, which accompanies it is of a peculiar kind, and seems to be forced out with a sort of

grunting noise. The difference between the inspirations and the expirations—the breathing-in, and the breathing-out—is also most remarkable, but easily accounted for. Inspiration, or the act of drawing in the breath, is effected with the ordinary ease; but the extravasated air already diffused through the cellular tissue, is still the real cause of this difficulty, by offering a resistance to the complete ejection of the atmospheric air contained in the bronchial cells. Consequently, the broken-winded horse inspires with ease, but respires with a protracted and great effort, by means of very forcible contractions of his abdominal muscles. The respiration is performed by two apparent efforts, in one of which the usual muscles operate, and in the other the auxiliary muscles, particularly the abdominal ones, are put on the stretch to complete the expulsion more perfectly. When this has been done, the flank falls with peculiar force, and these muscles resume their relaxations.

Horses affected, may receive a palliative to the distress under which they frequently labour; but a perfect cure is impossible. The best remedy we have been able to discover to relieve broken wind is the following, and ought always to be kept in the stable, especially if the horse is required to do some extra work:—

For Broken Wind.

Gum Galbanium	2 oz.
Amoniacum	2 do.
Assafœtida	2 do.
Antimony	4 do.

Form into a mass with honey.

Divide into twelve balls, and give one occasionally.

Horses, from their prone position, are liable to pursiveness and broken wind; for in them the intestines press much against the diaphragm, or midriff, and, in consequence, on the lungs, and thereby cause the oppression of breathing. One remedy is, having particular care to their exercise and feed. The exercise should be gentle, and moderate as to its continuance. The food should always be the best of the respective sorts, and frequently given in small quantities, that the stomach may never be too full. All dry food, such as corn, hay, bran, &c., should always be moistened with water to prevent thirst, which generally attends this affection; particularly the hay, the flavour of which is much improved by damping, or sprinkling it with water. The corn should be increased in quantity, and less hay given; and what is given should be of the best description, sweet, clean, and well shaken, to divest it of all dirt and dust. Care should be taken not to make the hay too wet; for, if so, the horse will not eat it.

When there is convenience, broken-winded horses are best when kept out at grass at all times, their corn being continued as when they stood at hay; but when kept at grass for the purpose of relieving their wind, they should not be taken up to stable, except for immediate use; for, if taken from grass to dry meat, they become more oppressed in their breathing, from the difference of the change of food. If convenience cannot be had for constant running in the field, they may be soiled in a loose box in the stable, with any green food that may be in season at the time.

By care, in this method, numbers of horses have been much relieved, and made useful for many years.

There is also a small degree of broken wind, which, by dealers, is called pursiveness. Many pursive horses evince several signs of broken-windedness, yet never become thoroughly broken-winded, if not ill-used, or neglected. Great and foul feeders are always more or less thick-winded; and, except their diet and exercise are carefully managed, they will readily become so.

Due attention being paid to the diet and exercise of pursive horses, according to the directions already given for the broken-winded, tar-water, to the quantity of one or two pints each, may be administered the morning they are going to work. If to this be added a pint of warm ale, it will be found of great benefit in relieving the wind. Another excellent remedy for pursive horses is the cordial pectoral ball. The stable where horses are at all affected in the wind, however slightly, ought never to be without a good supply of this invaluable medicine.

CHAPTER XXVIII.

GLANDERS.

GLANDERS is a disease, the treatment of which has proved a perfect puzzle to the most scientific veterinarians.

There is no doubt that it is contagious, and it is generally thought incurable. The vast number of horses which have fallen victims to glanders, especially in the army, and in establishments where large numbers are kept, has attracted particular attention to the subject, especially in France and Italy; where, so early as about the beginning of the last century, many attempts were made to discover a remedy for it.

Lafosse, an eminent French veterinarian, considered it a local disease, and thought he had found a successful mode of treating it, in perforating the bones which cover the frontal sinuses, and injecting, through the opening, astringent and other liquids.

After this opinion had been published, some English farriers made a trial of it; and others poured detergent lotions into the nostrils, the nose being drawn up for the purpose, by means of a pulley. Attempts were also made to cure it by arsenical fumigations; and some went so far as to burn out the submaxillary glands between the jaws, or to slough them out by caustics. The various preparations of mercury, copper, iron, and arsenic, have likewise been used. At the Royal Veterinary College, a solution of from two to five drachms of the sulphate of copper, combined with a little linseed meal, is the remedy made use of.

From the circumstance of horses having sometimes escaped the disorder, though they have been standing in the same stall or stable, or drinking out of the same bucket or trough with a glandered animal, many have been led to doubt its being contagious; and the little care that some large proprietors have taken to prevent the spreading of the disorder, in consequence of such an opinion, has been the cause of very numerous and serious losses. That the glanders is contagious, has been clearly and indisputably proved by numerous experiments, and the manner in which it is propagated has likewise been satisfactorily demonstrated. At the same time, it must be admitted, glanders will arise from inoculation; and this not by wilful intention, but from accident; for, suppose a glandered horse to have stood in a stall, and some of the matter from his nostrils to have hung about the manger—a fresh horse coming into that stall, may, from its strangeness, smell about, when any rough substance that he may come in contact with, may occasion an abrasion of the skin. Should this abrasion touch the poisoned matter of glanders, the horse will decidedly become affected.

In a general way, however, close unwholesome stables, hard work, and bad provender, sudden changes from cold and wet weather to hot stables—in short, anything that will weaken the animal considerably, is likely to produce glanders and farcy. There will be no longer any danger in admitting this opinion, if, at the same time, we keep in view the contagious nature of the disorder, in whatever manner it may be produced. For, if such cruel and foolish treatment of horses does not produce glanders or farcy, it may produce other disorders, which are often more speedily fatal; and if it does not actually produce a disorder, it weakens the constitution to such a degree, that the animal is rendered more *susceptible* of the contagion of glanders, as well as of other diseases. It is from this cause that glanders spreads so rapidly among post and coach-horses; while, among horses of a different description, its progress is generally slow.

Some writers have said that glanders has often been generated in the cavalry, by putting the horses, immediately after coming from camp, where they are constantly exposed to the weather, into warm stables, and giving them a full allowance of oats. This, it is true, has often brought on inflammation, and inflammatory disorders of several descriptions,

which have proved very destructive, especially the catarrhal kind; in which cases they are accompanied with a discharge from the nostrils. The acrimony of this discharge will sometimes even ulcerate the nostrils, and the disease would then be considered as a decided case of glanders. Frequently we have known the distemper, or epidemic catarrh, produce this effect.

The first symptom of this disease is generally seen in a discharge of glairy matter from one or both nostrils; principally, or usually from one only, and more frequently from the left than from the right nostril; a swelling of the submaxillary glands, or kernels between the jaws, and generally on the side of the jaw corresponding to the affected nostril, and frequently attended with cough; the membrane of the nose, especially that which covers the cartilaginous part, or septum, becomes, from the fineness of its texture, ulcerated; as do the many small blood-vessels distributed thereon. In consequence of this, it becomes more susceptible of the disease, especially in its acute form.

Sometimes, however, glanders is accompanied by a disorder of the superficial absorbents of the skin, named *farcy*, which has been considered by many authors as a distinct disorder; but we think that it is always a symptom of glanders, whether it appear in a local or constitutional form.

Glanders is divided into two stages—the acute and the chronic; or the first and the second stages. Acute glanders is generally attended with *acute farcy*, such as chancrous ulceration about the lips, face, or neck, with considerable or painful swellings on different parts; some of these swellings appearing in, what the old farriers called, a corded, or knotted vein. Ulceration and swelling of the hind leg, or sheath, and sometimes of the fore leg, with corded veins, and what is termed farcy-buds on the inside of the limbs, also accompany glanders. Acute glanders often spreads rapidly, and either destroys the animal, or renders him such a pitiable and hopeless object, that the proprietor is usually induced to have him destroyed.

Chronic glanders is generally very mild in the first stage, and does not affect the appetite, or the general health and appearance of the animal. Horses affected no further with it, when properly fed and taken care of, and worked with moderation, will often continue in regular work for several years. Many glandered animals have been known to get rid of the disorder while working; and, on several occasions, fresh-purchased horses, and particularly if old ones, have escaped the disorder. Hence it is that many have been led to believe that the glanders is not contagious.

The second stage of glanders is marked by ulceration within the nostrils, or an appearance in the matter which indicates ulceration, though it is sometimes too high up to be seen. The matter is in larger quantity, more glutinous, sticking about the margin of the nostril and upper lips, and occasionally obstructing the passage of air, so that a sort of snuffling noise is made in breathing.

The matter is frequently streaked with blood, and the horse sometimes bleeds from the nostrils in working. When this happens in the first stage of the disorder, however early it may be, it indicates the approach of the second stage. The matter begins to have an offensive smell, which it scarcely ever has in the first stage. In the second stage, the matter is generally discharged from both nostrils; whilst the glands under the jaw become larger, harder, and fixed more closely to the jaw-bone. They are also generally more tender to the touch than in the first stage. The inner corners of the eye are also mattery. The animal loses flesh and strength, and is apt to stale more than usual. He coughs heavily and hard, and at length dies in a miserable condition, generally farcied as well as glandered. It is with this disease as it formerly was with small-pox inoculation, and is now with vaccination. If a person happens to meet with one or two cases, or even half-a-dozen, of horses escaping the glanders, after standing in a stable with one that is glandered, he thinks himself fully warranted in concluding that the disease is not contagious. Satisfied with this decision, he gives himself no further trouble about it, and pays no attention to anything that may be said or written in opposition to his own opinion.

It is a remarkable circumstance, that glanders cannot be communicated by applying the matter which is discharged from the nose of a

glandered horse, to the nostrils of a sound one, even though a piece of lint soaked in the matter is put up the nostrils, and kept in contact with the pituitary membrane for a short time, or even if the matter is thrown up the nostrils by a syringe. But if the smallest quantity is applied in the way of inoculation, either to the membrane of the nostrils, or to any part of the body, there will be produced a glanderous ulcer, from which farcy-buds and corded lymphatics will proceed. After a short time the poison will get into the circulation, and the horse will be completely glandered.

The circumstance of glanders not being communicated by applying matter to the nostrils, enables us to account for a horse escaping the disorder, as he sometimes does, after being put into a glandered stable, or standing by the side of a diseased animal. We have great reason to believe that glanders is frequently communicated by accidental inoculation. Glanders can also be communicated by the air, by the effluvium which issues from the glandered horse, in the same way that putrid fever is communicated; yet we knew a traveller who used to journey from Deptford to London daily, and who kept two horses in the same stable, one of which was highly glandered, and remained so for three years; but the other horse never caught the infection, which would lead to the supposition that there must be, in some instances, a predisposition to the disease before it can be caught. Glanders, it has been said, cannot be produced by the matter applied to an old wound or ulcer; but of this we have great doubts. A sound horse has been inoculated with glanderous matter which had been mixed with ten times its weight of water. This produced some degree of inflammation, and a small ulcer of a suspicious nature; but after two or three days the ulcer got quite well. This shows that glanderous matter may be so far weakened by dilution with water, saliva, or the watery secretion from the lower part of a glandered horse's nostrils, when he has the affection in a very slight degree only, as to render its being incapable of communication to others. On the other hand, when a large opening is made in the skin of a sound horse, and a piece of tow or lint, soaked in the glanderous matter, is put into it, in the manner that rowels are inserted, the disorder is communicated in so violent a degree, that the animal is destroyed by it, generally in a few days. The same effect may be produced if glanderous matter is mixed with a little warm water, and injected into the jugular vein of a sound horse.

A horse affected with glanders, may inoculate himself, and thereby produce farcy. Horses, when out at grass, are frequently affected by an itching, and are apt to bite their heels, when the flow of matter from the nostrils inoculates them, and produces farcy. The possibility of this circumstance taking place may be easily proved by inoculating a glandered animal in any part of his body with some of his own matter. There are many ways in which a sound horse may be accidentally inoculated with the matter of glanders, for the slightest scratch in any part of the body is sufficient. Horses that are cleaned with a curry-comb, are very liable to be scratched in those parts where the bones are most prominent; such as on the inside of the hock, the knee, and on the shank-bones. To such scratches glanderous matter may be applied even by the hands of the groom, after he has been examining the nose of a glandered horse, or wiping off the matter from his nostrils. It may, also, be done by the horse himself transferring glanderous matter from the nose of a diseased animal, or from the manger, or other part where any matter has been deposited; for horses are very fond of rubbing their noses against the manger or stall; and a glandered animal will generally rub off the matter from his nose against the manger, the rack, the stall, or against another horse. If a sound horse happens to stand by one that is glandered, they will often be seen nabbing, or gently biting each other, or rubbing their noses together, when glanders to the sound one may be the result. In short, when we know that glanders is thus communicated, we can conceive a variety of ways in which a horse may be accidentally inoculated. On one occasion, at the Royal Veterinary College, two grooms, who had the superintendence of the glandered stables, became, themselves, affected with the disease, and were obliged to be removed into an hospital.

When a horse has been twitched, he gene-

rally rubs his nose and lips with considerable force against the manger, and may thus easily inoculate himself with a glandered splinter or nail. The parts where the local farcy first appears, are those most likely to be accidentally inoculated; namely, the inside of the hocks, the knees, the shanks, the lips, and the under-jaw, where grooms are often trimming off the long hair with sharp-pointed scissors, or singeing with a candle, and causing an itching, which makes the horse rub the part against the manger. In this way the heels frequently become wounded. Horses that are kept on grains, bad hay, or any kind of bad provender, are liable to itching humours, which make them nab or bite their skin, and scratch the hind leg with the opposite foot. We may often see them bite, rub with the nose, and alternately scratch with the hind foot, the other leg. Even after inoculation, a month may elapse before the disease makes its appearance; and in all experiments for the production of glanders, some days, at any rate, will elapse before any ulcer or chancre is produced. It will be a week or two before farcy-buds or corded lymphatics will appear; and in some cases, probably, a month before the running from the nostrils will come on, except when a young ass is the subject of experiment. If we reflect upon all these circumstances, there will be no difficulty in admitting the following conclusions, in reference to glanders—namely: That glanders is a contagious disorder, communicable by inoculation, or by the effluvium proceeding from a glandered animal, that may have been kept in a stable with others, which, from weaker constitutions, have greater *susceptibility* to be affected by the disease, than others of a more robust and strong constitution. It has been also asserted by some clever veterinarians, that swallowing a quantity of the matter made into balls will produce the disease; but this we never found to be the case, as we have tried it in several instances, both on horses and asses. In doubtful cases—that is, when there is much difficulty in determining whether the discharge from a horse's nostril is glanderous or not (and such cases frequently occur)—he should be removed to a stable, to remain by himself. Then purchase an ass, which may always be obtained for a few shillings, and inoculate him with some of the glandered matter. We have generally done this in the inside of the fore leg, on the plate-vein; and in two or three days, ample proof will be afforded, in the actual condition of the horse, whether your judgment be correct or not. We recommend this plan, because a valuable horse may be preserved at the expense of a few shillings. If the matter is really glanderous, a peculiar kind of sore or chancre will be produced. From this ulcer, corded veins, as they are termed, will proceed, and farcy-buds, or small tumours, will take place. In about a week the animal will run at the nose, and, in a short time, take on all the appearance of complete glanders.

In such a case, the disease is always very rapid, and always proves fatal. If the matter is not glanderous, no effect will be produced by it. In large establishments, where many horses are kept, this will be found a valuable test for determining with certainty the nature of a discharge from the nostrils. However mild the glanders may be, and although ulceration of the nostrils cannot be seen, and the quantity of matter that may be discharged is small, and the animal appear in good health and condition, the ass will be as certainly affected by the matter as if the disease were in the last stage, or in its most virulent degree.

For the sake of those gentlemen and agriculturists who may reside at some considerable distance from a regular veterinary surgeon, we will describe the method of performing the operation of inoculation.

Cut off a little hair to the size of half-a-crown, from the inside of the fore legs, where you can feel the vein. We prefer this part, because we have found the poison act quicker when injected here than in any other place, it being immediately on a large vein, which renders the communication of the poison to the system more expeditious. Then take a lancet, and introduce it under the skin, for about three-quarters of an inch in length. The orifice must be wiped free from the few drops of blood which may make their appearance. Have ready lint or tow that has first been well impregnated with the glandered matter, and introduce it into the opening with a probe, or small slip of wood. This being done, make a small wadding of tow, and place over all. Apply a bandage to the part, to keep

in the lint, and let it remain for a few days, and patiently wait the result.

If the matter is glanderous, the part will become excessively sore in about two days, and a scab will form on it. This, in a short time, will be thrown off, leaving a peculiar kind of ulcer, which will often spread rapidly, causing a painful swelling of the adjacent part, with corded veins, or farcy-buds. After this, glanders will soon appear. No other matter will produce such an effect; showing at once the nature of the disease.

When colts are kept at grass, as they generally are, until three or four years old, they will have passed through a disease by which the whole constitution appears to be depurated, and consequently becomes invigorated. This is called *strangles*, which most frequently occurs when colts are kept on poor pasture, and which debilitates the animal to such an extent, that it often degenerates into glanders. While the colt is at grass, and kept well, the disease generally runs its course without much inconvenience to the animal, and without requiring the interference of art; but when he is taken up, broken-in, put to work, and kept in hot stables, and incautiously fed upon hard and stimulating food, before strangles has taken place, a horse has often this disease with great severity.

Sometimes strangles comes on, and does not pass through its course in the natural way; the swelling under the jaws does not suppurate, or become an abscess, but remains hard; or a superficial opening takes place, from which a small quantity of matter is discharged, and this is sometimes supposed to degenerate into glanders.

This kind of glanders often terminates in consumption. It is accompanied with cough, and the discharge is generally from both nostrils, and more like pus than the matter which comes from the real glanders arising from contagion. From its not being contagious, however, it should be distinguished by another name. We would restrict the term glanders to those discharges from the nose which are capable of communicating the disease to other horses. This would be found highly useful in practice.

We now come to the consideration of the most difficult part of this subject, namely, the cure of glanders; and it is needless to say anything of the mode of prevention beyond observing, that this can only be accomplished by taking care that no glanderous matter comes in contact with the horse, or mixes with his food or water; and that the only method of purifying an infected stable is, to remove everything on which glanderous matter may have fallen, and to thoroughly wash and scrape the fixtures, such as the rack and manger. The stable should be well whitewashed, and the stall strewed with a solution of chloride of lime.

We have observed that glandered horses have, in several instances, been known to get entirely free from the disorder while employed in moderate work, and carefully fed and attended to, with little or no medicine. The general opinion of both English and French veterinarians, we believe is, that glanders is incurable, but that farcy is curable. During an extensive experience, we have succeeded in curing many cases of farcy, when it has been a local disorder; but such cases are generally followed by glanders, although there has been often a considerable interval—from a few weeks to a few months—between the disappearance of the one, and the appearance of the other. When glanders and farcy appear at the same time, or when farcy breaks out in a glandered horse, it would depend upon the state of the blood, as to its impregnation with the glanderous poison, whether we should recommend him to be immediately destroyed. We would, however, make an exception to this where a glandered horse has inoculated himself. Then the farcy is at first only local; but as it soon becomes a fresh source of contamination, and, in a short time, increases the disorder, it always becomes necessary to destroy the animal. The cure of glanders cannot be accomplished without great care and considerable expense; and rarely at all, we believe, except in its first stage, or mild form.

The expense of the cure does not depend so much on the sort of medicines employed, as the length of time that is necessary to effect it; and it also must be recollected, that in saying the disease is curable, it is by no means to be understood that there is a certainty of success in adopting any mode of treatment. Therefore, unless the horse is of considerable value, in good condition, and glandered only in a mild

degree, it is not worth while to attempt the cure. It should also be recollected, during the treatment, that so long as there is any discharge from the nostrils, there is danger of its communicating the disease to other animals. Calomel has been tried, even to salivation, without the desired effect; also, Ethiop's mineral, or quicksilver rubbed down with chalk; but these are fallacious, and we may say, useless. *Tonic medicines*, and those principally of the mineral kind, have been resorted to; and the present practice of the Royal Veterinary College, for this disease, is to administer certain quantities of sulphate of copper. This was formerly done in balls; but it is now found much more convenient, and we believe is more beneficial to the animal, to be exhibited as follows:—

Sulphate of Copper, from 2 to 5 drachms.
Linseed Meal . . . . 1 oz.
Warm Water . . . . 6 do.

Dissolve the sulphate in warm water; then add the meal, stirring them well together, until incorporated. Give this draught every morning.

We have seen some good effects arise from this, when the horse has commenced with it in the early stage of the disease; but when the disease has got a firm hold of the lungs, it is of little or no avail. We have succeeded in several cases, when advised of the state of the animals in time, by giving the following, either in form of a ball, or a solution, as in the last:—

Sulphate of Iron . . . 3 drachms.
Gentian . . . . . 3 do.
Form into a ball with treacle.

It is better to give this in the form of a ball; whilst the horse should be turned out into a pasture of grass by himself, to prevent all possibility of his coming in contact with any other horses. If possible, a warm shed should be in the paddock or field. Give the ball about the middle of the day, and, every night and morning, a feed of good oats and beans. By turning the animal out, he will breathe the natural air, not respiring his own over and over again, as if in the stable. Then, by the tonic medicine and good feed, if he is of any constitution at all worth the expense, it will be found that this is the only practicable means of removing glanders. Constitution has so much to do with the disease, that if well supported by art, these are the only means to be adopted. We should say, never treat a horse affected with glanders in a stable. The horse, also, by hanging down his head to gather his food, relieves himself, and the discharge comes more freely from him. However, practice and experience in the treatment of this disease, must be the leading features for obtaining a knowledge of it.

CHAPTER XXIX.

EPILEPSY; PALSY; SPASM; COLIC, OR GRIPES; TETANUS, OR LOCK-JAW; STRING-HALT.

EPILEPSY.

THE affection termed *epilepsy*, frequently affects cart and waggon horses more than any other kinds; and in different counties and localities, it assumes a variety of names, such as *meagrims, sturdy, turnsick, the falling-sickness, the falling-evil*, &c. The affection, in its first attack, comes on suddenly, and without any previous indications. The animal, if in exercise, stops short, shakes his head, and looks wandering; in which state he continues a short time, and then will go on as before. If the case should be a violent one, he frequently falls to the ground, or commences turning round and round, until he drops apparently senseless.

The whole system appears agitated by strong convulsions; he dungs and stales insensibly, at times becoming exceedingly violent; at others, appearing as if life were extinct, unconscious to everything around him; his eyes seeming fixed, and often his jaws

are so closely set, that his mouth cannot be forced open. At other times he labours under convulsive motions, and his limbs shake so violently, that he even breaks the pavement with his feet, if he fall in such a situation. Sometimes, while the legs are stiff, the head and body are violently agitated. These varieties of symptoms frequently attacking him alternately, it is not to be wondered at that the affection should remain on him, in some instances, two or three hours, more or less, and then that he should recover, sometimes without any return of it; at others, the fits are more or less troublesome, according to the success of the means applied for relief. As the fit goes off, there is generally a foaming at the mouth; the foam being white, and resembling that of a healthy animal.

The causes of epilepsy are several. It appears to be dependent on a kind of spasmodic affection of the brain, either from too tight reining up, or the collar pressing too hard. It may also arise from blood being forced to the head by constitutional disorders. Worms is a cause of it. Horses of very full habit, plethoric, or over-fed, are liable to it, particularly when not having constant exercise.

For the curative means for epilepsy, nothing can be done while the horse is enduring the fit but the following, which will be found excellent:—

Strong Liquor of Ammonia . .	1 oz.

While the convulsion, or fit, is on, hold the bottle of ammonia frequently to his nose; and in all probability he will immediately jump up, or, at least, in a very short time, with the fit driven from him. Should he be a large cart-horse, in high condition, take four or six quarts of blood from him; feed him on cold bran mashes, and give a dose of physic or two, according to his strength or size. The mercurial ball, composed of blue pill and aloes, is also very good in this case. If it can be procured, occasionally feed with grass; but hard food must be lessened. We have seen some poor farmers' horses attacked violently with this disease, and have attributed it to the excessively hard and bad arrangement of the harness with which they were furnished. Therefore too much care cannot be bestowed on the gearing with which a horse is caparisoned.

PALSY.

Palsy is when a part of the body loses its power of moving, or feeling, or both. This disease, amongst the old farriers, was called *plant-struck*, or *shrew-run*.

If there is only a trembling, or shaking in the part, or if only one limb is attacked, it is seldom dangerous. But when it seizes both limbs behind, the case is very troublesome and difficult to cure. The horse going at the slowest pace, reels about, and, with difficulty, is able to stand at all. On turning round, he is obliged to form an immense circle, to accomplish the act, which frequently ends in a fall.

This, of course, would lead our attention to examine the horse's loins, which always occasion him to exhibit pain on pressure; showing that there must be some morbid action going on in the spinal marrow; either in the substance itself, or the parts that cover it. Or, perhaps from some accident, a small portion of bone is pressing upon it there; and consequently deprives the posterior nerves of their action. We have no doubt that it may occur from turning in a narrow stall; for it is truly distressing to see some horses placed in such hen-coop stalls as they are, when, in endeavouring to come out, they twist themselves almost double. As this affection is not of unfrequent occurrence, every person who knows the value of a good hackney, will be glad to see it removed. The stimulating applications are the best, such as the following:—

Cantharides, powdered . . .	1 oz.
Oil of Turpentine	2 do.
Olive Oil	3 do.

Mix, and shake well together in a bottle, and apply a portion of it over the loins, night and morning.

Or,

Tartar Emetic	2 drachms.
Hog's Lard	2 oz.

Form this into an ointment, and apply, until small pimples arise. Give the mild mercurial alterative ball—(See *List of Medicines*)—every second or third day. Some people are exceedingly fond of applying what are called changes, and ordering a run at grass for a few months. A cure by such means is sometimes effected; but in this case, as in many others among the old farriers, the praise is ascribed

to the least deserving part of it. The farrier says, "It was my change that restored the horse;" leaving rest and *Dr. Green* completely out of the question. In India there is a disease called *kumree*, which always ends in complete paralysis of the hind quarters. Most of the horses used in that country are stallions; and these are the subjects that become affected. We never saw it in a mare or gelding, with the exception, that the horse, on the commencement of the attack, had gone through the operation of castration, which is imagined to be a remedy for it; but we never found one cured by this, or any other remedy; for the horse will continue getting worse and worse, until he is unable to rise at all, and is consequently destroyed.

SPASMS.

Spasm is an irritability of the muscular fibre, excited by an action of the nervous system, producing various affections, known under the general name of spasm, but subdivided according to the part affected with this excitement. When universal, it forms *tetanus;* when confined to the bowels, it forms *gripes;* and when it attacks the neck of the bladder, obstruction to the urine follows. Inflammation of the sensorium, or of the nerves, or of the investing membranes of these organs, can produce this excitement. Thus, in phrenites, the horse is excited to exertions much beyond his usual powers. Irritation occasioned by foreign substances can also produce it; perhaps, by exciting an immediate inflammation, although the instantaneous spasm which follows mechanical pressure and irritation, both in the sensorium and the nerves, can scarcely be accounted for thus.

In medical treatment, sedatives act either by allaying the nervous excitement, or relaxing the part affected with spasm; such as opium, tobacco, &c.: antispasmodics, also, by rousing the heart and arteries to a new action; as gin and pepper, spirit of turpentine, rendering the part above or below the disposition to be excited. In very violent cases of spasmodic affections, copious bleeding, combined with solutions of aloes and opium, are powerful antispasmodics. In the spasmodic state of the neck of the bladder, nauseating medicines are found to be the best antispasmodics; such as digitalis, or white hellebore. The remedies which act by altering the susceptibility of the parts, are principally bleeding, purging, or clysters, and other evacuants, which diminish the excess of power; and are, therefore, extremely proper in plethoric subjects, or when the spasm is attended with great vascularity. When, on the contrary, the spasm attacks a subject already in a debilitated state, recourse must be had to the stimulant remedies, to bring the part to a state to resist the impressions. (See *List of Medicines*).

SPASMODIC COLIC, OR GRIPES.

Spasmodic colic is, amongst agriculturists, known as *fret gripes*, &c. Although it is termed flatulent, or windy colic, wind is not so predominant a symptom as it is in the human subject. The small intestines seem more the situation of spasmodic colic than any other part of the horse; but there are instances where the large intestines have become affected; and when it proceeds so far back as the rectum, the bladder then also participates in the convulsion, and frequent ejections of urine occur. In other instances the neck of the bladder suffers, and suppression of urine then becomes remarkable; but these are only in extreme cases. Colic is dependent on a spasm of the muscular structure of the intestines. We have evident proof of this from the appearances which present themselves after death, where cases have proved fatal; when the small intestines, more especially, will be found puckered and drawn together; or some portions will afford marks of violent contractions, as though they were tied round with a cord. Occasionally we find an interception, or one portion of intestine invaginated within the other; in which case inflammation is usually brought on by it.

Spasmodic colic, however, generally exists without inflammation, though it frequently terminates in it, when suffered to have a long continuance, from there being no speedy remedy at hand, or no surgeon living in the neighbourhood to administer proper relief. Rubbing the belly with a hard stick, &c., should, on such occasions, on no pretence whatever, be done. Powerful purgatives to overcome the costiveness, usually present, frequently have this tendency; but a still more frequent cause is the invagination of one por-

tion of intestine within another. In attending to the medical treatment of colic, care should be taken that it is not confounded with inflammation of the bowels; the remedies for each of these diseases being diametrically opposite to each other.

Spasmodic colic generally makes its appearance very suddenly, and is not marked, as in inflammation of the bowels, by previous indisposition; the horse being, at once, attacked with considerable uneasiness, shifting his position from side to side, pawing the ground, and stamping with his feet, impatiently and violently.

In a few minutes after this, the pain will appear to go off, and leave the animal tolerably easy; but in inflammation of the bowels, the pain constantly occasions the stamping, and it does not pass away, even for the shortest space of time. As the colic proceeds, remissions of pain become less and less. The horse lies down frequently, and, on rising, shakes himself, looking anxiously round to his sides, and sometimes, in desperate cases, even biting at them, or snapping at them with his teeth. He also strikes at his belly with his hind feet, as if determined to remove his sufferings himself. In inflammation of the bowels, the above symptoms are seldom so severe, the pain not being so great. When on the ground, he frequently rolls on his back; in which situation he will remain four or five seconds, or probably roll over; neither of which he does in simple inflammation.

The pulse is the next thing to command attention, which, in colic, seldom becomes much altered from its natural state, unless the affection has existed some considerable time, when marks of general irritation sometimes present themselves; the pulse being somewhat hardened and quickened. Occasionally, when the paroxysms are on, a slight alteration may then be felt; also in the early stages, should the pain be great; but slight alterations come and go as the pain passes off.

If the horse is under the immediate influence of existing spasm, he will, in some instances, present a full bounding pulse, but oftener a wiry, though quickened beat; both of which may be taken for inflammation. The legs in colic are but seldom affected, and never remain cold for considerable periods of time together; but the coat stares, and the horse breaks out frequently into cold sweats. He often attempts to stale, without effect; at other times he stales frequently. Generally he is costive; a few dry balls only being forced from him during the spasmodic fits.

Spasmodic colic is produced by cold supervening on heat, either through the medium of application to the skin, or by sudden application to the bowels, in the form of cold water, taken when the horse is very warm. Costiveness will sometimes occasion it, through improper food; also tares, or vetches, given on their being first cut. When they are full of moisture, the animal is apt to eat greedily of them; and especially if the weather is warm.

In some, gripes are frequent, under every variation of food, situation, habits, &c.; so as to give reason to suppose there must be some peculiarity of formation, hereditary tendency, or the presence of calculi in the intestines of such animals as are subject to them.

For the cure of *gripes*, we should recommend bleeding, more or less liberally, according to the violence of the disease, or its longer or shorter duration; or its continuance, without mitigation. Extensive bleeding is one of the most powerful relaxers of spasm with which we are acquainted; and, instead of its being an antagonist to the antispasmodic treatment, usually adopted by internal remedies, it is found to be infinitely increased in efficacy; and especially when conjoined with opium. Though most of the ordinary cases of gripes will pass away with the common treatment of stimulants, and many go off without any treatment at all, yet bleeding is always a safe and prudent precaution, as a preventive of inflammation; and, in more aggravated cases, it becomes essentially necessary, both to combat the inflammatory tendency, and to promote the relaxation of the spasmodic irritation. It is likewise particularly to be noticed, in violent or protracted cases, to counteract the irritative qualities of the antispasmodics, which, in simple gripes, may do no harm, yet may do so when an inflammatory tendency is at all suspected, or already begun. In every such case, bleed liberally; say, at least six quarts; which, if the horse is in anything like moderate condition, cannot do harm. We have known horses bled in the mouth for

gripes; but never saw any good arise from it. Giving the animal a brisk trot for about a quarter of an hour, after either of the following remedies, we have proved to be exceedingly beneficial; but he should never be made to go faster than the trot. Brushing the belly well will be of service; but never rub it with a stick, as this tends to bruise the parts, more than to do good. We have known the turpentine liniment, rubbed well all over the abdomen, to be a great assistant in removing the spasm. Hot fomentations we do not approve, as the water that may lodge in the hair, when it becomes cold, will frustrate all good intentions.

As internal remedies, either of the following will be found very efficacious in removing the disease:—

No. 1.

Ground Black Pepper . . .	½ oz.
Tincture of Opium . . .	1 do.
Good Ale (warmed) . . .	1 pint.

No. 2.

Common Gin	½ pint.
Tincture of Opium	2 oz.
Good Ale (warmed) . . .	1 pint.

If costiveness should be present, give—

No. 3.

Oil of Peppermint	2 drachms.
Castor Oil	6 oz.
Tincture of Aloes	4 do.

Should the costiveness continue, the horse must be back-raked, and warm clysters administered, with a handful of salt thrown in each, about three quarts at a time, until the bowels are relieved. Should other means of assistance not be ready at hand, give the following:—

Ground Black Pepper .	1 teaspoonful.
Common Gin . . .	½ pint.
Good warm Ale . . .	1 do.

Should the disease continue longer than may have been expected, repeat the remedies until relief is obtained. If the clysters should not have the desired effect, take a large onion, peel, and quarter it, and pass it up the rectum, which will speedily stimulate it to action.

TETANUS, OR LOCKED-JAW.

Tetanus, or Locked-jaw, is a violent spasmodic contraction of the muscles, coming on in the elevation of the lower jaw, and extending, more or less, to all the muscles destined to perform voluntary motion. This disorder, which may be excited by different causes, is much more common in hot climates than in temperate. However, it too frequently occurs in this country, and happens to be one of great difficulty to cure, especially in consequence of wounds; and more particularly after injuries of tendons and ligamentous parts. It is one of the most fatal symptoms which can possibly arise in these cases, and therefore demands the most assiduous attention of the veterinary surgeon.

Tetanic complaints generally affect middle-aged, or old horses, more frequently than young ones. The causes producing them are cold and moisture applied to the body while it is very warm; and sudden vicissitudes of heat and cold; or they may be produced by punctures, lacerations, or other lesions of nerves in any part of the body. There are, probably, some other causes of this disease; but they are neither distinctly known, nor well understood. If the disease proceeds from cold, it commonly comes on in a few days after this being taken; but if it arise from puncture, or other lesion of a nerve, the disease does not come on for many days after the lesion has happened—very often, when there is neither pain nor uneasiness remaining in the wounded part; and very frequently when the wounded part has been entirely healed up. The disease sometimes attacks suddenly, with great violence; but, more generally, it makes its approaches by slow degrees to the violent stage. In this case it comes on with a sense of stiffness in the muscles of the neck, which, gradually increasing, renders the motion of the head difficult and painful. The haw of the eye, also, will be seen protruding, on the least motion of the hand being raised towards the head.

As the rigidity of the neck increases, there is commonly, at the same time, a sense of uneasiness felt about the root of the tongue, which, by degrees, causes a difficulty in, and, at length, an entire interruption of swallowing. While the rigidity of the neck goes on increasing, there arises a pain, often violent, at the lower end of the back, which makes the tail stick out with a quivering motion. When this pain arises, all the muscles of the neck,

and particularly those of the upper part of it, are immediately affected with spasm, as it were, drawing the upper part of the head violently and strongly backwards. At the same time, the muscles which draw up the lower jaw, and which, upon the first approach of the disease, were affected, are now generally afflicted with more violent spasm, and set the teeth so closely together, that they do not admit of the smallest opening.

This is what has been named *locked-jaw*, or tetanus, and is often the principal part of the disease. When it has advanced thus far, the pain at the top of the neck and lower jaw is renewed with violence. As it proceeds, a greater number of muscles become affected with spasm. After those of the neck, those along the whole of the spine become affected, bending the trunk of the body strongly backwards, whilst the horse keeps his fore legs stretched directly out before him.

At the extremities, both the flexor and the extensor muscles are commonly at the same time affected, and keep the limbs rigidly extended. Though the extensors of the head and back are usually the most strongly affected, yet the flexors, or those muscles of the neck which pull the head forward, as well as the muscles which should pull down the lower jaw, are also, often at the same time, strongly affected with pain and spasm. During the whole of the disease, the abdominal muscles are in a violently spasmodic state, so that the belly of the horse is strongly contracted, and feels as hard as a piece of board.

At length, the flexors of the head and trunk become so strongly affected, as to balance the extensors, and to keep the head and trunk almost in a straight line, and so rigidly extended, that they are incapable of being moved in any way. It is to this state the term *tetanus* has been strictly applied.

At the height of the disease, every organ of voluntary motion appears to be affected, and amongst the rest, the muscles of the face. The eyes also seem distorted, commonly rigid, and scarcely movable in their sockets. The nose also appears drawn up; and the spasms are, everywhere, attended with most violent pain. The utmost violence of spasm is, however, not constant; but, after subsisting a minute or two, the muscles admit of some remission of their contraction, although of no such relaxation as can allow the action of their antagonists. The remission of contraction gives also some remission of pain; but neither is of long duration. The attacks of the disease are seldom attended with any fever. When the spasms are general and violent, the pulse is contracted, hurried, and irregular; and the respiration is affected in like manner. The heat of the body is commonly not increased. The extremities are generally cold, with a cold sweat over the whole of the body. Blood is frequently drawn in this disease; but it never exhibits any inflammatory crust; and all accounts seem to agree, that the blood drawn is of a looser texture than ordinary, and that it does not coagulate in the usual manner. It is no less extraordinary, that in this disease, the natural functions are not either immediately or considerably affected; and it is usual for the appetite of hunger to remain through its whole course.

This disease frequently follows docking and nicking; it has also been known to occur after castration.

To cure tetanus is very difficult. So many remedies have been tried, and so many failures arisen, that there can be no certain remedy pointed out for the removal of so distressing an affection. The cold bath had, for a long time, its advocates; but without any real good. If one horse got well under such treatment, it was applied to all, but not with general success; consequently, it fell into disuse. Bleeding, as a relaxant to the spasmodic action of the muscles, has also shared the same fate. Blistering the whole course of the spine has met with no better success. Even the old farrier's remedy, of docking the tail about an inch, does not seem to carry a *specific* with it. Unctions, balsamic, and spirituous embrocations, which many practitioners have recommended, are not only useless remedies, but even hurtful. If the case arise from a wound, a local inflammation ought to be excited in the wounded part itself, and the inflammation roused as high as may be consistent with the resolution afterwards. We certainly know that nothing promotes a general phlogistic diathesis through the system more than a wound, attended with a high degree of inflammation; but this is not always to be obtained,

though the strongest stimulants the whole list of medicines could produce may be applied; for we have found that in wounds productive of tetanus, there is an absolute want of this inflammation, so necessary to the cure and well-being of the patient. To obtain this inflammation, the best thing to do is to enlarge the wound as much as may be convenient, and insert a pledget of tow, dipped in warm oil of turpentine.

We have restored a horse from tetanus by a strong solution of aloes, combined with laudanum, as under:—

Spirituous solution of Aloes . .	3 oz.
Laudanum	1 do.

Give this mixture frequently; say every three hours. If the jaws are so closely set that it cannot be given to the horse by the mouth, have his head elevated by force, and pour the mixture into a quart bottle; then carefully pour it down one of his nostrils; which, after a little time, he will not resist. When he has began to take the above without much difficulty, break a little of the cordial pectoral ball with it. Continue this until you see a change for the better; which will be known by the jaws becoming loose, when a favourable termination to the disease may be expected. Give clysters the whole of the time you are exhibiting the medicine. We have administered prussic acid; but never with any good effect. We have also administered brandy, with the cordial pectoral ball dissolved in it, with good effect. In conclusion, we should never give a case of tetanus up, until we have tried every means possible.

STRING-HALT.

String-halt is an involuntary and convulsive motion of the muscles, which either extend or bend the hock; principally considered in the superficial muscles, or the facia lying on the inside of the thigh, and causing the horse to twitch up one or both his hind legs in a most remarkable manner. Strains and blows are the causes to which this disease is generally attributed. We once were called to a horse that had been cast into a ditch, and we were obliged to employ ropes to extricate him. He had struggled very hard whilst in the ditch, but, when released, he had the affection of string-halt in the leg that was underneath. A cure is seldom effected. We have known soap liniment, well rubbed on in the inside of the thigh, to relieve the disease; but never saw a perfect cure. On some parts of the continent it is considered a graceful movement when in both legs.

CHAPTER XXX.

INFLAMMATION OF THE BRAIN, OR MAD STAGGERS; INFLAMMATION OF THE STOMACH, OR STOMACH STAGGERS; INFLAMMATION OF THE LUNGS; PULMONARY CONSUMPTION.

INFLAMMATION OF THE BRAIN, OR MAD STAGGERS.

Mad Staggers is one of those diseases which, happily, seldom affects the horse; and it is fortunate for the poor animal that such is the case, for the pain arising from it must be intolerable. This disease, like many others has acquired various names, constituting, in former practice, a variety of different diseases; though by the advancement in veterinary science, they have all been nearly reduced under two heads. These names were applied to such disorders as principally affect the head, having their seat in the brain, or vessels leading thereto; such as apoplexy, convulsions, epilepsy, stag-evil, frenzy, or fever, &c., &c.

Mad staggers, or inflammation of the brain, may be defined as being a determination of blood to the brain, causing considerable pressure on that organ, as well as on the vessels leading to it. How far the pretended accuracy, formerly distinguishing one of these

diseases from another, may be appreciable by modern comprehension, or receive general credit, we know not; but confess, where the judgment has to be formed from observation alone, made by a close scrutiny of the patient, circumstances very seldom so far concur as to enable us to form so singular a distinction. Experience and observation may, undoubtedly, do much, in a collection of similitudes and probabilities, but never sufficient to enable us to ascertain the distinct, invariable causes and effects of diseases, where the most trifling difference is hardly acknowledged. More particularly is this the case when it is considered that the cause of all these disorders is in the original seat of nervous irritability, the brain; or in those parts connected with, or dependent on its structure and purposes; except when the diseases are understood to be symptomatic, or dependent upon some original remote cause—as the effect of bots, preying upon the stomach or intestines, internal ulcerations, or complaints not immediately discoverable. These may sometimes happen, but very rarely, to affect the frame with symptoms truly alarming.

Horses, upon the approach of any of those disorders whose seat is directly in the brain, or nervous system, display considerable weakness and inactivity; seeming to move reluctantly, reeling, or staggering in their walk; frequently blinking with their eyes, as if their vision were imperfect, and feeling some disagreeable impression, or uneasiness, from the effect of light. They are also much averse to being handled about the head, and are brought out of the stable with difficulty. In time, a visible tremor comes on; and, after reeling, or frequently turning round, if loose, they fall almost lifeless to the ground, having only the perceptible power of breathing with violence and agitation.

Horses affected with staggers have a disinclination for food of all kinds. They have also a slight discharge of moisture from the eyes, which, if attentively observed, even in the earliest stages of the disease, will be found inflamed, and somewhat flushed in colour. Hence the blinking of which we have spoken. The nostrils also may be observed redder than usual; but this is not always a true symptom. As the disease advances, the horse appears impatient, and throws himself about in a most extraordinary manner, as if he were frightened; or he falls into a drowsy state, holding his head low, and resting it on the manger. Then, all of a sudden, he will commence throwing himself about again. If the disease should not be speedily alleviated, but continue for a day or two, he will exhibit a kind of vacant stare, or watchfulness; the eyes will appear set, as it were, in the head—their sight almost gone; his nostrils expanded, his head raised as high as he possibly can, as if staring at the rack. He now becomes more furious and violent; dashes about the pavement in convulsive and insensible struggles; perhaps, falls, then suddenly rises again, to renew his violence.

Diseases originating in the most abstruse recesses of nature, though of a very complicated construction, may proceed from a variety of *causes*, clearly comprehended; as, in all probability, they may likewise do, from many that we are entirely unacquainted with. Among the former is that which originates in the increase of the velocity of the blood, instantaneously affecting the brain, as we find when we exceed the bounds of humanity, and exhaust the strength and power of an animal, made by nature sufficiently strong to accomplish almost every task the ingenuity or avarice of man might be supposed to invent. In corroboration of this, the premature deaths, occasioned by increasing the velocity of the blood beyond the limits prescribed by nature, extend principally to post-horses, in the extreme heat of summer; and may be attributed to the impatience of travellers, or inhuman drivers.

To these, some, but very few, private horses may be added, being hard driven upon long journeys; and others, imprudently ridden and improperly managed during chases of great length, in strong deep countries, with fleet hounds.

Others become the subjects of these disorders, from great irritation in the stomach and bowels; the powerful effects of bots in the intestinal canal; sharp and acrid medicines; a repulsion of any morbid matter from the surface, without its being carried off by proper evacuants, &c. They are frequently known to attack very suddenly; at other times their

approach is indicated by the symptoms before recited.

The most rational method of *cure* for these diseases is, by correcting or discharging the primary cause, which will be to allay the spasms, and to reduce the extreme degree of irritability, by strengthening the nervous system. To obtain this end, the first step will, at all events, be to draw blood, the quantity to be regulated according to the state of the subject. In cases of real alarm and danger, take from six to eight quarts away at once; and we have seen much relief obtained in bleeding from the *jugular vein*, and the *thigh vein*, both at the same time. It causes a greater revulsion in the system, although it becomes absolutely necessary afterwards to stimulate and rouse the animal powers. As little can be done during the time of the fit or paroxysm, prepare a clyster of warm water, in which a handful of salt should be put, and given as soon as possible.

Should spasms or convulsions prove so violent, that by a contraction of the muscles the jaws become locked, or fixed for any considerable length of time, recourse must be had to nutritive clysters, that the constitution may be supported. Notwithstanding its inability to receive aliment by other means, there are several kinds of nutritive clysters, that may easily and expeditiously be prepared, consisting of broths of different kinds, which most houses have in readiness. Oatmeal gruel, in which a little starch has been mixed, is an excellent strengthening clyster. These clysters should frequently be given, until a ball can be safely administered. If the mouth be not sufficiently open to admit of the hand being safely introduced, take one of the cordial restorative balls—see *List of Medicines*—and dissolve it in about a pint of warm water, and carefully horn it down. This will rouse the system from the debilitating effects of the spasms.

If the horse is not sufficiently relieved, but still keeps drowsy, and inclines to hang his head down, or bear against anything, as it were, for a resting-post, immediately bleed again from the opposite jugular vein, and also from the opposite thigh-vein, taking as much blood away as he can possibly bear. Then take of

Tartar Emetic	1 drachm.
Hog's Lard	1 oz.

Form into an ointment, and rub the whole at once on the forehead. This will cause pimples to rise, which will speedily relieve the brain.

Should any local paralytic affection, or contraction of the muscles, produce a stiffness or inactivity upon any part, recourse must be had to friction, with penetrating embrocations; for, during the paroxysms of the disease, the animal is so liable to injure himself locally, that it is necessary to use stimulating applications to remove the bruises, &c., that he may have received. For this purpose take

Oil of Tar	4 oz.
Oil of Turpentine	2 do.
Spirits of Wine	2 do.

Mix, and apply to the parts affected, night and morning. This must not be negligently done, and should be persevered in for *twenty minutes* at each dressing.

Horses of a full plethoric habit, when attacked with this disease, should, as soon after recovery as they are able to bear it, be brought under a course of regular evacuations; such as are most applicable to their size, state, constitution, and condition. If they are inclined to fluctuating humours, or viscid heavy foulness, give one or two purging-balls, according to strength, &c., as before remarked. (See *List of Medicines*). If purgative medicine should be considered too strong, change it to alterative, which will act more mildly, and have a good effect. Give, at the same time, soft food, as bran mashes, or mashes with a little corn in them.

If the disease should have arisen from worms affecting the stomach, administer the mercurial purging-balls; for which, see *List of Medicines*.

INFLAMMATION OF THE STOMACH, OR STOMACH STAGGERS.

Stomach staggers is a disease to which many horses fall victims; few, or rarely any, recovering from the effects of its attack. Generally speaking, it almost always proves fatal; and although many practitioners have boasted of being possessed of a remedy, and although many cures have been said to have been effected by them, such cures have not taken place in what may be denominated stomach staggers. In examining horses that have died of this disease, the stomach has been generally loaded with hard,

dry food; so large sometimes in quantity, that it is difficult to conceive how it could have sustained the load.

The disease may exist in a great variety of degrees; for it may go on until the stomach contains from fifty to sixty pounds; but, in such a case, we consider it to be of the worst description, and absolutely incurable. The same disease, however, though in a considerably less degree, occurs much more frequently than the public are aware of. It is often curable by simple means, and without difficulty; and yet often terminates fatally, through ignorance, or unskilful management. As the degree in which the disease happens is various, so are the symptoms diversified, and distinguished by a variety of names. They all originate, however, in the same cause, and that is indigestion. The name *staggers* has been applied, when the disease exists in a sufficient degree to disturb the functions of the brain: but this does not happen until the vital power of the stomach has, to a certain extent, been impaired by a continuance, or a frequent repetition of improper feeding; and this morbid state is more rapidly induced, when, in addition to improper feeding, the animal is worked hard, and generally ill-treated. How often do we see a great number of horses confined the greater part of a market-day in the court or stable of a public-house, without food, and none given to them until they return home, probably a distance of many miles, when they are permitted to eat, even to repletion, nothing but bad hay. Thus is a load of indigestible food taken into the stomach, at a time when its vital power has been diminished by fasting; but such is the power of this important organ, that it will resist for a time even this treatment; and it is only by a repetition of such injuries that it is at length rendered incapable of digesting sufficient food to restore itself and sustain the body. That degree of exhaustion, or diminished power, or, rather, that debilitated condition of the stomach which gives rise to staggers, is seldom curable. If the animal does recover from the disease, the morbid state of the stomach is such, that unless he is afterwards fed in the most careful manner, he generally dies suddenly; and the supposition is that this is the result of some other disorder. There is nothing except excessive exertion, perhaps, that does so much injury to the stomach as bad hay; and when these causes are combined, the most formidable diseases are produced, and almost all of them depend on the diminished energy of the stomach.

If we consider the important office of the stomach—namely, the preparation of food in order to form blood, and thereby repair the waste or wear which all the muscles are constantly undergoing—what can be expected when it is supplied with food that contains but little nutriment, and requires its utmost exertions in order to digest it? The excessive exertions in which horses are commonly employed in this country are sufficiently known. Custom, we fear, has so familiarised many avaricious horse proprietors to these cruel exertions, as to prevent them from viewing the situation of the horse as they ought; and we frequently hear them boasting of their driving or riding an animal so many miles in a short space of time, as if the merit of the performance was due to them instead of to the quadruped. The stomach-staggers, however, is not so common as it used to be. We have known farmers absolutely ruined by the disease, from its having continued among their horses until all of them have been destroyed. The better feelings which have taken place among this class, and which are still spreading, render diseases among their horses far less frequent than they used to be. A concurrence of the causes before noticed—that is, excessive exertion and improper feeding—were wont to be most frequent amongst post and stage-coach horses; and it is here that diseases of the digestive organs are oftenest to be met with. Stomach-staggers, however, is not the symptom that occurs; it is one of a different description; that is, flatulent colic, or gripes. The condition of the stomach, which produces this, is exhaustion of its vital power; differing from that which produces stomach-staggers, not only in degree, but also in kind. In stomach-staggers, the power of the stomach is so gradually diminished, that the disorder almost imperceptibly takes place, and is rarely observed until it is incurable. In the other, the disease is more rapidly developed, and therefore the effect is different.

In most instances this disease has termi-

nated fatally, in consequence of medical advice not being called in early enough, and its ravages suffered to go on until the animal is irrecoverable; but even if the veterinarian is called in early, he is frequently baffled in his attempt at a cure, let his abilities be ever so great; for, if he administer medicine in the shape of balls, they become completely neutralised, in consequence of the over-distention of the stomach, and the consequent inflammation set up. A draught, however, should be given as early as possible. Some writers have recommended a solution of aloes in large doses, but this we consider quite contrary to good practice; for, though the grand object should be to remove the contents of the stomach as early as possible, aloes would be most likely to debilitate that organ, and produce nausea; consequently it would be incapable of acting on its contents; for costiveness of the stomach and intestines cannot be overcome without acting on both, and that in a very different manner. To overcome the one, use the following clyster:—

Common Salt	8 oz
Tincture of Aloes	4 do.
Warm Water	2 quarts.

Inject—after first back-raking—and hold the tail well down upon the anus, that the horse may retain the clyster as long as possible. Repeat this operation until the bowels are quite empty. At intervals, apply to the region of the stomach—

Oil of Turpentine	4 oz.
Olive Oil	2 do.

Rub this well in; and should it not have the desired effect, repeat the quantity. At the same time give the following:—

Common Gin	1 pint.
Tincture of Myrrh	2 oz.
Camphor	1 do.

First dissolve the camphor in the gin; then add the tincture. Give this new-milk warm. If the animal should not appear better in the course of an hour, repeat the draught. This will, in all probability, stimulate the stomach to a new action, to get rid of its contents. We have restored several horses by the above treatment; and, if taken in time, we question its ever failing. Everything having passed off agreeably, administer good gruel frequently; but give little or no hay, as that will tend to irritate the stomach in its weak state. Bran mashes, with oat or linseed meal mixed in them, will be good enough; but refrain from giving corn of any kind, until satisfied he is perfectly recovered, as the least irritating food may occasion a relapse.

INFLAMMATION OF THE LUNGS.

This disease is one of the greatest difficulty with which the veterinarian has to contend, as it proves so frequently fatal. It was not understood by the older farriers, and consequently they administered hot stimulating drugs, which they conceived would banish or eradicate a disorder, which generally ended in death, until the establishment of the Royal Veterinary College, when a new system of practice was promulgated. The disease is now understood, and thousands of horses that would have been doomed to the dog-kennel, have lived to follow the chase; saying nothing of the numerous roadsters and hacks, as well as draught-horses, that have lived double their time, from the well-known knowledge and experience which have been diffused through the veterinary world during the present century. There is in the human subject a disease called *pleurisy*, which consists of an inflammation in the thin membrane which covers the substance of the lungs, which, being intimately connected with the substance of the lungs itself, and the cavity of the chest, has been thought to have been a disease of itself in the horse; but such is not the case. The pleura of the horse is seldom or ever the situation of the disease. If the pleura should be diseased in the horse, it is in connection with the substance of the lungs. Whenever the blood is prevented from circulating freely through the lungs, it becomes the origin of several other disorders.

Disease, it is well known, is not always sent as a punishment, but is intended by nature as a process by which the animal economy should be changed or restored; and nature provides many more forces than one, to remove a portion of all kinds of animals periodically. This law rules the vegetable kingdom also. But the diseases of horses mostly spring from their artificial life; and to none are they more subject than to inflammation of the lungs.

Against the symptoms of pneumonia, or in-

flammation of the lungs, it is necessary to guard the practitioner from mistaking them for those of catarrh, or of the mucous membranes in contiguity, with which they may be confounded; though the experienced veterinarian will readily distinguish between the two. In the catarrhal epidemic, the extremities do not continue invariably cold, but are sometimes cold and sometimes warm. The distress of countenance is not so great; sore throat is commonly present; breathing is less laborious, and the pulse seldom oppressed.

The cough in catarrh is generally deep, and very painful; a weakness, not corresponding with the violence of the symptoms, is very early seen in the complaint; and, though the lining of the nostrils may be inflamed in catarrh, it is seldom so much so, if *pneumonia* be coming on, as to present a purple hue. The principal necessity which exists for making a careful distinction between the two diseases, arises from its not being found prudent, in the catarrhal affection, to push the bleeding, and other parts of the depleting system, so far as in the pneumonic; and also from the greater necessity of placing the horse in a cool temperature in the latter, to what exists in the former. Inflammation of the lungs has, also, by the inexperienced, been occasionally mistaken for colic; because the animal sometimes exhibits considerable uneasiness, and often looks round to his sides; in which mistaken cases, the treatment generally pursued has been such as to increase the disease. But, in colic, acute pain is shown to be felt. By turns the horse lies down and rolls, and then suddenly rises, stamping with his fore feet, or kicking at his belly with his hind legs; while, in *peripneumony* he never lies down, but stands stupidly quiet, except now and then, when he may look at his flanks, but without any of the indications of pain to which he is forced by colic. It may be added, also, that the nasal membrane, in colic, remains unaltered in colour, unless inflammation of the lungs be at hand.

CAUSES.

The alternation of heat, with cold, is probably the most usual cause of this complaint. It was formerly considered that it could only be produced by removal from a warm to a colder temperature; but it is now known that the sudden access of a warmer medium produces it also, though certainly not to an equal extent. Exposure to simple cold has been said never to produce this disease; and, though turning horses to grass without preparation may emaciate them, it never produces *peripneumony:* but this appears not to be borne out by experience, and has occasioned ill consequences. Human subjects, horses, cows, sheep, and dogs, are all more liable to coughs, colds, and pneumonic affections, in cold than in warm climates. The persons who slaughter horses in London, are accustomed to expect a great number in the winter, especially if it is severe and frosty, from the fatal effects of inflamed lungs. Hunting on a cold scent, with frequent checks, or travelling with a cold wind blowing against the chest; washing the legs and body with cold water while the animal is hot; a sudden removal from a warm stable to a cold one—any of these may cause inflammation of the lungs, if great care is not taken; and, as has been remarked, the removal from a cold stable to a warmer one, or from grass to a warm housing, without preparation, may also produce it. In fact, so liable are horses to affections of the chest from a change of temperature—whether it be from a warmer to a colder medium; or otherwise, from a colder to a warmer—that it is very seldom a horse is brought from a dealer's stable, that does not, in a day or two, exhibit some cough. When he is removed from a cold temperature into a hot one, it is evident that the hot medium immediately attacks the seat of inflammation; and as hot air must tend to accelerate the circulation, it is not difficult to give a reason why it produces the disease, and this more certainly if the heated air is less pure than that which the animal was removed from. When, on the contrary, the removal takes place from a warm to a colder situation, perhaps a similar effect also takes place. The cold air immediately affects the lungs, which may, by its sedative properties, particularly if the change is very great, be suddenly weakened. But it is not only by application to the immediate cellular substance of the lungs, through the medium of respiration, that cold acts injuriously on them. It oftener exerts its baneful influence through the medium of the skin, with which these organs are connected by a sympathetic and peculiar

union, and which is liable to be at all times exposed to the vicissitudes of temperature; for both skin and lungs appear emunctores of the fœcal parts of the blood, and hence the sympathy between them is observed to be very great. Anything, therefore, that may prevent the exit of this fœcal matter, called *perspiration*, from the vessels of the skin, will throw much more of it on the lungs. When, therefore, in addition to these occasional causes, we consider that the lungs are very large, as well as very important organs, and that in an animal of speed they are peculiarly extensive in their surfaces, and extremely vascular in their structure, we shall be at no loss to account for their tendency to inflammation.

This tendency, also, seems much heightened in common with the proneness to other diseases, by artificial life; for in a state of nature, or one nearly approaching to it, they are seldom attacked. Even cows experience this increased tendency, arising from artificial habits, as may be observed in those kept near London, and other great cities, where they are more artificially supported, and subjected to occasional housing.

Cure of Inflammation of the Lungs.—The principal modes of cure are two: first, to lessen the increased vascularity or distension of the lungs, by bleeding; and second, to endeavour, by external stimulants, to change the diseased action: that is, by raising an external inflammation, we try to lessen the internal one; and it must be remarked, that as this disease is obstinate and quickly fatal, so the treatment must be active and immediate. The cure should therefore be promptly begun by bleeding, according to the age, size, and strength of the animal, regard also being paid to the length of time the disease has existed; for, when the treatment is commenced too late, the bleeding cannot be carried to the extent that it may be, at an earlier stage of the complaint. As a general rule, bleedings for inflammation of the lungs, should never be continued longer than is necessary to raise the pulse; that is, supposing this to be previously in a depressed state, which, in true *pneumonia*, it usually is: and in every stage it is quick, and without fulness, even though somewhat hardened. More good is, also, gained by one bleeding within the first twenty-four hours of the disease, than from numerous repetitions of it afterwards. From a moderate-sized horse, five, six, or seven quarts, or even more, may be drawn; and should the symptoms indicate a necessity for it, particularly if the pulse rises on the first bleeding, in five or six hours take three or four quarts more; and as long as the breathing continues laborious, the extremities permanently cold, and the pulse depressed, but rising on the flowing of the blood—so long the bleeding should be repeated to the amount of two or three quarts at a time, at intervals of six or eight hours. This is recommended under a supposition that the treatment commences soon after the attack; but if otherwise, and violent symptoms have existed thirty-six or forty-eight hours, the bleeding must be repeated with more caution, and the pulse most attentively watched; or the opposite extreme may be fallen into, and such debility succeed, as may produce the very event desired to be avoided—namely, the hastening of gangrene or effusion. It is of considerable importance to draw the blood quickly, by means of a large orifice, as directed under *General Inflammation*, and to suffer the blood drawn, to cool gradually without disturbance, when the buffy surface will have an opportunity of showing itself, and afford conclusions to be drawn whether bleeding should or should not be further persisted in. Immediately after the first bleeding, some active stimulants should be applied to the surface of the chest. Blisters have the effect of taking off the hair, which disfigures the horse for a long time afterwards; and therefore their use is sometimes objected to. They, however, act by stimulating the parts not immediately affected, and prove a counter-irritant; and there is no specific virtue in one matter more than another, beyond its degree of stimulating action to the part to which it is applied. The degree of irritation necessary, must be proportioned to the degree of inflammation it is intended to counteract, by also becoming a counter irritation. (See *Blisters*). If that be very considerable, the medicinal stimulant must be so likewise; and we know of none whose energy is great in this respect, that will not raise the cuticle, and separate the hair. Consequently, as blisters act powerfully

as stimulants, and particularly as they continue such action for some time, they should never be dispensed with. Whenever, therefore, the symptoms are at all urgent, proceed, at once, to blister the chest, and between the fore legs, and also from the sides behind the elbows; as it should be remembered that active blistering is the quickest mode of subduing the inflammation. The state of the bowels should be next attended to, and gentle relaxation encouraged; but not purging. To obtain this end, back-rake, and throw up a laxative clyster (see *List of Medicines*); but active purging must, by all means, be avoided. Mr. Coleman formerly recommended, after blistering or rowelling, that the horse might be turned out into the open air, however cold, without other medical treatment than nauseating doses of aloes. Latterly he recommended, and with very great propriety, a well-ventilated box, with slight clothing, taking care that the legs are well rubbed and bandaged, either with woollen bandages, or, if not with these, with hay or straw; and should this not have the desired effect of producing warmth in the extremities, a blister to be applied to them, which would be found more efficacious. The muzzle, ears, and the whole of the head, in fact, may be considered as an extremity, and, as such, should likewise be particularly attended to. The ears may be hand-rubbed, and the head clothed in a neck-hood; and the animal littered well up to the belly with clean straw. It must, at the same time, be kept in mind, that the more care taken to promote warmth in the surface and the extremities, by clothing, &c., so the more care should be taken to counteract any tendency these means might have to encourage arterial excitement, which is best effected by a cool and pure temperature of about fifty degrees.

For internal medicine, take of the following immediately after the first bleeding:—

Cape Aloes	1 drachm.
Digitalis	1 do.
Nitre	3 do.

Mix with honey to form a ball.

Give every six hours, or oftener, according to the urgency of the disease. In cases where cough is present and troublesome. add to the former—

Liquorice powder	2 drachms.

Should this not relieve the cough as much as desired, give—

Linseed Meal	2 oz.
Oatmeal	2 oz.
Warm Water	2 quarts.

Mix well together, and boil. Administer this draught every six hours, until relief is obtained With regard to food, no particular anxiety need be manifested for the first twenty-four hours, during which, the less the animal eats the better, unless green food can be procured for him. This being more cooling and opening, should be given, if possible; but, in its absence, bran mashes may be allowed *cold*, with only a small quantity of hay. Corn should on no account be given, or the head steamed with hot mashes. As before observed, we must abstain from producing purging, and also carefully endeavour to avoid costiveness. The extremities must also be carefully examined, as to their hotness or coldness, and every endeavour made to keep them as warm as possible. By steadily pursuing this mode of treatment for a day or two, it will then be seen whether the patient is getting better or not. If the fever and inflammation appear to have quite left him, still continue the linseed and oatmeal gruel, in which, once a day, put

Pul. Gentian	1 drachm.
Sulphate of Iron	1 do.

If the disease should occur in mild open weather, the horse would be greatly benefited by being turned to grass, for one or two hours in the warmest part of the day—

PULMONARY CONSUMPTION.

Pulmonary consumption may also be called chronic inflammation of the lungs. It is a disease that commences slowly, but almost always ends fatally. It frequently follows cold, or is a sequel of acute inflammation of the lungs. In these instances, the horse, for some time, seems not to be affected with any disease, though the lungs are decidedly touched the whole time. He is, however, occasionally observed to be affected, and gradually a short dry cough comes on; the coat becomes also harsh, dry, and altogether unsightly. As the disease advances, we always distinguish a peculiar smell about him, rising both from his skin and his dung. At length the appetite becomes affected, and pus, mixed with mucus, which

in the latter stages is mixed with coagulæ, is observed to be passed from the nostrils. This escapes by the mouth also, as well as the nose, in the act of coughing. In the still more advanced stages, the discharge increases, and is attended with an exceedingly disagreeable smell. The hair falls off in patches, the body wastes, and the complaint either degenerates into farcy or glanders, or the animal sinks under the disease itself. If a horse is destroyed in the early stages, the tubercles appear like knots, or kernels, dispersed through the substance of the lungs. They are sometimes smaller, or larger, as the case may be; mostly darker, but sometimes lighter, than the surrounding substance. In later stages these are found to degenerate into abscesses, and terminate in universal ulceration. When horses are opened at this point of the disease, they are said to be *rotten*.

Horses affected with consumption, may do a considerable deal of slow draft work, by occasionally giving them one of the restorative balls (see *List of Medicines*); but a perfect cure is impossible; palliatives being the only remedies that can be made use of.

CHAPTER XXXI.

DIGESTION; INDIGESTION

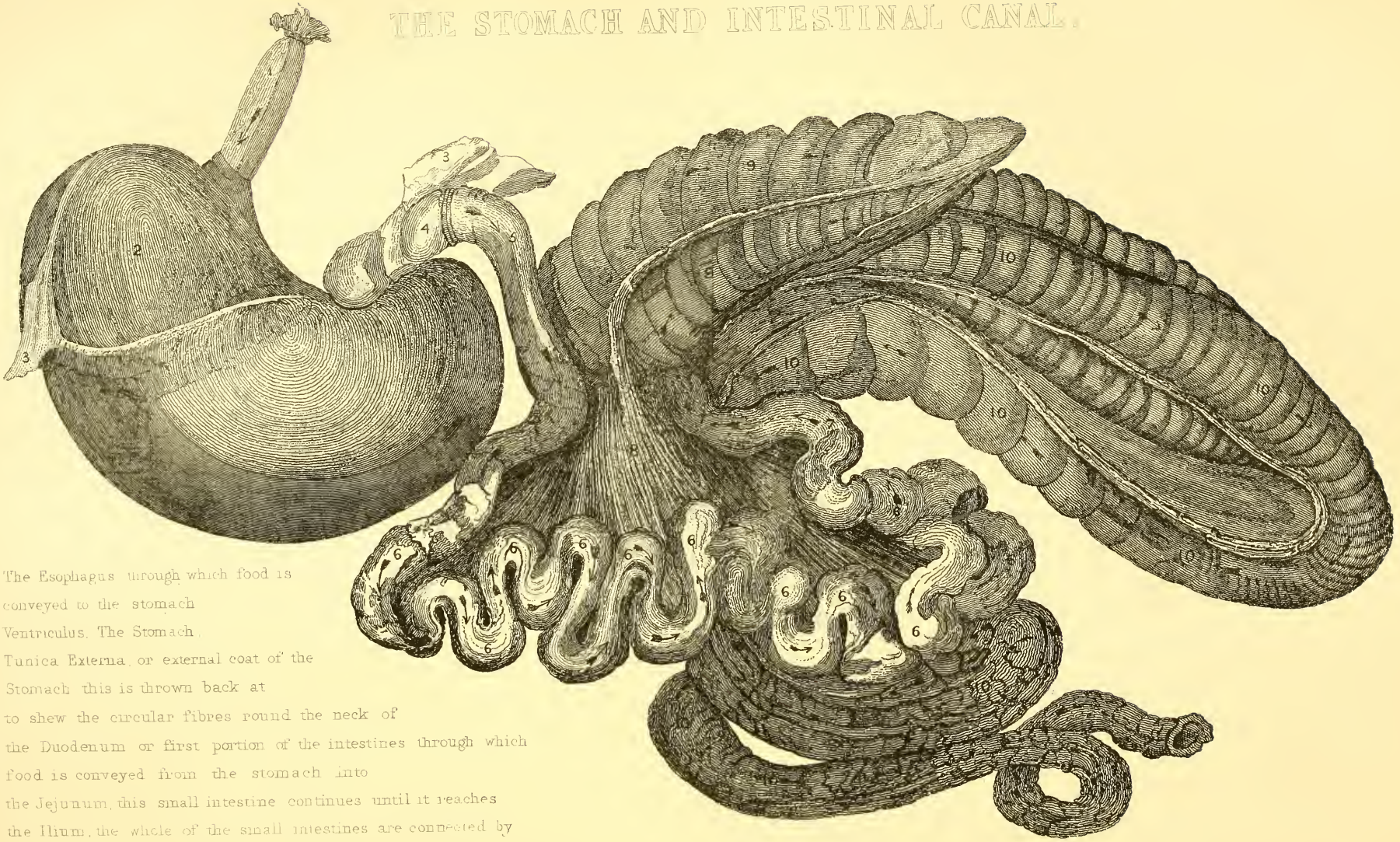
DIGESTION.

By *digestion* is meant that process by which the food, or certain parts of it, are converted into a white fluid (resembling milk), named chyle. To render it fit for undergoing this process, which is performed by the stomach, it is necessary that it should be perfectly masticated, and mixed with saliva. Supposing, then, that the food is of good quality, and in sufficient quantity, a defect in the organs of mastication, a deficiency of saliva, or a want of vital power in the stomach, must render the operation imperfect, and the chyle formed by it unfit for the purpose for which it was designed—namely, the formation of pure blood. Mastication is often rendered painful, and, consequently, is imperfectly performed, by a defect in the grinding teeth; that is, by keen edges, or sharp points being formed in the upper grinders, which wound the cheeks, and sometimes are the cause of ulcers being formed there.

Horses constantly fed on dry food, and never allowed grass, are the most subject to this. The upper and under grinders do not meet each other horizontally, but have an oblique inclination inwards; and the grinders of the upper are more distant from each other than those of the under jaw. By this arrangement, the food, as it is ground, falls inward upon the tongue.

The inside of the upper grinders, when worn down nearly to the gum, as happens frequently in horses of the above description, allows some portions of the corn to fall into the mouth before it is masticated, and this is generally swallowed unbroken. The horse feeling sensible of this, tries to throw the wear upon the outer edge by an inclination and peculiar motion of the jaws, which the French express by the phrase "*faire les forces.*" In doing this he often wounds the cheek with the upper grinder, which, in such cases, is always worn to a very keen edge. The cheek inflames and swells, and becomes still more liable to injury. In this way a permanent thickening of the part takes place, and, not unfrequently, deep ulcers. From this cause a horse swallows a considerable portion of his corn without chewing it; and such corn, being indigestible, is always voided with the dung. For a time, this defect may be remedied, by rasping the outer edges of the upper grinders with a concave file made for the purpose. Whenever corn is found in the dung of the animal, there is reason to suspect the

THE STOMACH AND INTESTINAL CANAL.



1 The Esophagus through which food is
conveyed to the stomach
2 Ventriculus. The Stomach
3 Tunica Externa, or external coat of the
Stomach this is thrown back at
4 to shew the circular fibres round the neck of
5 the Duodenum or first portion of the intestines through which
food is conveyed from the stomach into
6 the Jejunum, this small intestine continues until it reaches
7 the Ilium, the whole of the small intestines are connected by
8 the Mesenterium The Ilium terminates in
9 the Cæcum or blind gut from which proceeds
10 the Colon, this intestine proceeds in the drawing
beneath the small intestines, to
11 the Rectum.

THE ARROWS SHEW THE DIRECTION OF THE FOOD FROM THE ESOPHAGUS TO THE RECTUM

existence of this defect; but sometimes a horse will swallow corn unchewed, merely from eagerness in feeding. Filing the teeth does not, however, afford permanent relief; for, if a horse is again fed on corn, the teeth once more soon wear to a sharp edge, and the injury is repeated; and though filing off the sharp points prevents him, for a time, from wounding his cheeks, it does not prevent the corn from falling, unchewed, into his mouth, and from being swallowed in that state. There is not, however, so much difficulty in masticating hay, provided the animal is allowed sufficient time. It does not so readily fall into the mouth until it has undergone considerable chewing, and then it is more easily placed under the grinders again, by means of the tongue. The hay is at length masticated with great difficulty, and, after being kept in the mouth a considerable time, is rolled up like a chewed quid of tobacco, and thrown out into the manger. Such horses are named by dealers, *quidders;* and unless fed upon bruised oats, or soft food, must be starved. In such cases the muscles of deglutition, or swallowing, are more or less paralysed; so that if the animal is turned out, the grass will return through his nose, instead of being swallowed, and he will be starved to death. Horses having such defects in their grinders, should be fed with bruised oats, grains, bran, or other food that does not require mastication.

When a horse is at grass, there is a sufficient supply of saliva for the purposes of mastication, swallowing, and digestion; but when he is taken into the stable, and fed upon dry food, there must, of necessity, be a deficiency of saliva. The only method of compensating for this deficiency, and of rendering the food as fit as it can be made for mastication, swallowing, and digestion, is to dip the hay in water, and make the corn quite wet. This should never be omitted.

There is one cause of imperfect mastication, however, which should not be permitted to happen in the stable; yet it often does happen: and that is, dentition, or cutting teeth, especially when a horse is changing his grinders, which he does between the third and fifth year—not partially, as has been stated, for all the grinders are changed for permanent teeth. A horse ought to be kept out during a great part of this period; and if he is kept in, when he is observed to chew with great difficulty, he should have soft food. A want of vital power in the stomach, is a disease which, in the horse, exists more frequently than persons are aware of, and arises wholly from improper feeding, assisted however, too often by immoderate work. By improper feeding is meant the quantity and quality of the hay that is commonly given. This injures the stomach, not only by its deficiency in nutritious matter, and the impure chyle generated from it—thereby leading the animal to eat a greater quantity than he otherwise would but by the distension which the stomach suffers, which does it a serious injury, rendering respiration difficult, and weakening the whole muscular system. When a horse is constantly fed in this way, not only the stomach, but all the large bowels are loaded, and the diaphragm is, to a great extent, prevented from performing its office.

INDIGESTION.

In a healthy state of the stomach of a horse, his appetite is such as to lead him to eat only such food as is fit for the formation of pure blood. This food is grass, for he is certainly by nature a graminivorous animal. His stomach is remarkably small, and requires to be frequently supplied; therefore, in a state of nature, we find him almost constantly feeding. How great, then, must be the change which he suffers when taken into the stable; and what serious evils ought we not to expect, unless this change is gradually brought about, and his diet and exercise carefully attended to! When we consider in what manner he is generally treated, there cannot be any difficulty in believing that the stomach must, of necessity, be brought into a morbid condition. The labour he is employed in is generally excessive: the food which is most natural to him is often deficient in nutriment; for even grain is not suitable, because not natural to him; and we find that horses which have always been kept in a state of nature will refuse grain, and require some time, and the stimulus of hunger, to be brought to eat it. Good hay will always be preferred by them, especially when it has that fragrant smell, and greenish colour, which it

ought always to have. But, considering the use to which horses are applied, grain becomes a necessary diet; and, if properly dispensed, is the best food that can be given them. Hay, when really good, and allowed in moderation, is a very suitable diet, but requires to be assisted with grain, in a quantity proportionate to the work to be done. Some grain should always be given; as, without it, the quantity of hay necessary for the support of the animal would so distend the stomach, as to induce gradually, by a continuance of such feeding, a morbid, or depraved appetite. As it is, the hay generally given, even what is considered good, is so deficient in nutriment, difficult of digestion, and is eaten in such immoderate quantities, that the laborious exertions required in the muscular structure of the stomach to extract what nourishment it does contain, is such, as must of necessity bring on a morbid or depraved appetite; and what is, if possible, of still greater consequence, an exhausted state of sensorial power.

Wheaten straw, when the reed has been carefully separated from it, is much better fodder for horses than what is called middling, or indifferent hay; but the daily quantity should never exceed four or five pounds. Grain must be more freely given in this case, of course; but such a diet is far better than that commonly given to horses in this country.

In France, wheaten straw is very commonly used as food for horses; and the manner the owners have of distributing their diet, well deserves the imitation of the dealers in this country. The daily allowance is given at three different times—viz., a moderate quantity early in the morning, a smaller quantity at noon, and the largest portion at night. It is a general practice, in this country, to give an immoderate quantity of hay at a time. To give even bad hay, to distribute the daily allowance injudiciously, both of water and oats—to give beans unbroken, and to work horses while their stomachs are distended with food, much evil is done, and many fatal diseases brought on. So general are these practices, that we meet with but few horses with stomachs in a perfectly healthy condition. So numerous are the degrees of morbidness of the stomach, between the healthy state and that extreme degree of derangement, when the appetite has become depraved, inordinate, and even voracious, that it is difficult, if not impossible, to bring each of them under a distinct head. It will be sufficient for the purpose we have in view, to notice them, as they relate to the organs of respiration; that is, to treat of those diseases of the lungs and their appendages, arising from a morbid condition of the digestive organs. These diseases are commonly known by the name of *chronic cough*, *roaring*, and *broken wind*. To accomplish this in a manner sufficiently clear and intelligible, it is necessary to give a concise description of the organs of respiration, and those of digestion.

The mouth, the tongue, the throat, and the passages to the stomach and lungs, are covered with cuticle, but of various degrees of thickness; so that the sensibility of the different parts is nicely adapted to the purposes for which they are designed. These purposes are—gathering the food, masticating it, moistening it with saliva, and swallowing it. The first is effected by the front teeth; the second by the grinders; the saliva is separated from the blood by three pair of glands, named parotid, sublingual, and submaxillary.

The latter have always been described as lymphatic glands; but there is no difficulty in demonstrating that they secrete saliva, and their excretory ducts may be seen near the tonsils. The parotid glands pour out their saliva through an opening between the second and third grinder, on each side; and the sublingual by two small tubular papillæ under the tongue. It is by the motions of this organ that the saliva, necessary not only to facilitate mastication and swallowing, but likewise to perform a very important purpose in the stomach, necessary to digestion, is produced.

The masticated food is placed, by the motions of the tongue, into the upper part of the gullet, or œsophagus, which is named pharynx. The pharynx is large, and capable of considerable dilatation, but soon contracts into a small but strong muscular tube, named œsophagus. The part where the œsophagus begins, is so contracted as to have the appearance of a stricture; and it is here that the strong cuticular, or, as it is commonly named, insensible coat of the stomach, begins. When the food gets into the pharynx, it is swallowed into the œsophagus, and thence falls into the stomach,

by the muscular contraction of those parts. There is a glandular cavity on each side of the throat, named tonsil, which secretes a mucous fluid, which is retained in the cavity until wanted, by a semi-cartilaginous flap. This has been described as the opening of the eustachian tube; but this opening is situated immediately above it. The mucous fluid is forced out by the action of gaping, when it is wanted. The tonsil is the part affected in strangles; and the matter formed in this glandular cavity, passes down through the excretory duct of the submaxillary gland, inflames it, and causes it to become an abscess. This abscess is commonly, but erroneously, supposed to be the seat of strangles. The horse's stomach has nearly one-half of its surface lined with a strong cuticular membrane, which lines the œsophagus, and terminates abruptly, and by a fringe-like edge. It is on this part that bots are usually found. Sometimes, however, they leave this part, and attach themselves to the sensitive part of the stomach—properly so named—where the food is nourished and rendered fit for being converted into blood. In the horse, digestion and chylification are performed in the stomach only, not by any particular juice that is formed there, but by virtue of its sensorial power, which it derives in common with all the vital organs; and, in a more especial manner, from the *cerebrum* or brain, and from that part of the brain named *corpora pyramidalia*, through the eight pair of nerves, or *par vagum*, as they are termed.

It appeared necessary to go thus far into a description of the digestive organ—that is, the organs subservient to digestion—in order to impress upon the reader's mind the importance of the stomach in the animal economy; and to show how liable it must be to become diseased, when frequently distended with unwholesome food, containing little nutriment, and requiring great exertion to be digested—such as the hay often given to horses.

CHAPTER XXXII.

INFLAMMATIONS.—INFLAMMATION OF THE HEART; BOWELS; INTESTINES; LIVER; KIDNEYS; BLADDER; NECK OF THE BLADDER.

INFLAMMATION OF THE HEART.

Inflammation of the heart is a disease that rarely affects the horse; but it does occur sometimes in conjunction with inflammation of the lungs. In such cases, a quantity of water becomes effused in the pericardium, and constitutes water at the heart. The symptoms are so very much like those of inflammation of the lungs, that it is frequently mistaken for that disease. However, this is rather an advantage than otherwise; for here the same remedies may be brought into application. Still, there is one symptom by which inflammation of the heart may be discovered to have a distinct existence from all other diseases; that is, by the rebounding noise that organ makes at every pulsation, which may be clearly heard by any person standing in the stable, though unacquainted with the disease. Also, by placing the ear to the chest, it will be found that, at every pulsation of the heart, the fluid in the pericardium makes that undulating noise so peculiar to this disease, that it is almost impossible, with a little attention, to mistake it. On examining the pulse at the usual place, it will be found hard and wiry, and occasionally to have a fluttering motion. This will at once suggest the necessity of immediately drawing blood, not in a definite quantity, but as the pulse becomes affected; for if too much be taken, it will increase the debility which the horse is labouring under. However, bleeding must be resorted to; and that as extensively as possible. After this, the bowels must be examined; and if at all costive, he must be back-raked, and clysters of warm

water and salt thrown up until the passage becomes free and open. Also, take of

Solution of Aloes	2 oz.
Glauber Salts	4 do.
Linseed Meal	1 do.
Hot Water	2 quarts.

Mix, and give every six hours. This will not only allay the irritation of the heart, but will moderately open the bowels as required. Place the animal in a loose box, or bay of a barn, and treat, in other respects, as for inflammation of the lungs.

INFLAMMATION OF THE BOWELS.

Next to inflammation of the lungs, *inflammation of the bowels* is the most frequent and fatal of the local affections to which the horse is subject, and of which there appears two distinct kinds; the one affecting their villous coat, or surface, and producing purging; the other attacking the peritoneal coat, and usually accompanied with obstinate costiveness. It is the latter that forms the subject of our present consideration; the former will be treated of hereafter. From an imperfect acquaintance with the art, it has been common for farriers to mistake inflammation of the bowels for spasmodic colic, and the error has often proved fatal to the affected horse; for the *comfortable things*, and *heating drenches* given on such occasions, always increase the inflammation, and frequently produce gangrene. A careful distinction should, therefore, be made between the two, which may readily be done, if sufficient attention is given to the difference of characteristics which they severally display.

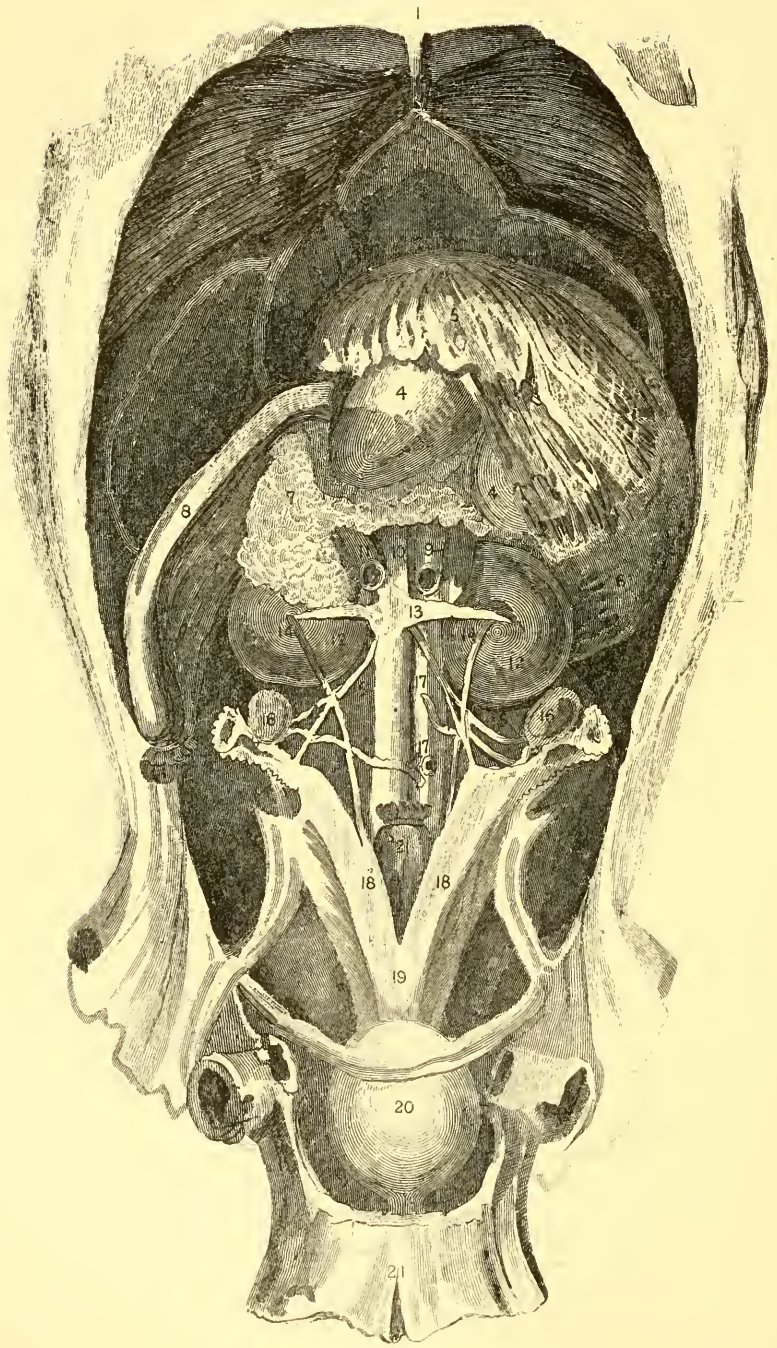
The symptoms of inflammation in the bowels are usually first indicated by a shivering fit, to which succeeds heat of skin, restlessness, loss of appetite. The mouth is particularly hot and dry, and the inner membranes of the eyelids, and the linings of the nostrils, rather redder than natural. As the inflammation advances, the pain increases, and forces the animal to lie down and get up again frequently; but, as the pain is less acute, he very seldom rolls on his back, as he does when afflicted with gripes. Sometimes, however, he kicks at his belly, or stamps with his feet; and, in all cases, scrapes his litter or stall with his hoofs, and looks wistfully round towards his sides. The pulse is frequent; sometimes rising to seventy, and hard and wiry; but in gripes or colic the pulse is scarcely ever affected; and even the breathing, in inflammation of the intestines, is not usually so laborious as we at first might expect, in consequence of the painfulness the belly is labouring under. In this, like most other inflammatory cases, the extremities are cold; while the surface of the body is often hot, but scarcely ever exhibits any natural perspiration. The bowels are usually confined; and if any evacuation takes place, it consists of hard, dry matter, rather inclining to a black colour. The urine is made sparingly, and is high-coloured; and a strong sign of the complaint is a very early and excessive debility.

The causes are various; but they are generally dependent on the application of unseasonable cold; such as washing when hot, or plunging the animal into a river. The drinking of cold water has likewise produced it, though more frequently this occasions spasmodic gripes. A long retention of the fæces may bring it on; as likewise hernia, or intussusception, which is occasioned by one part of a gut becoming invaginated within another. It may also be produced by metastasis, or the translation of the inflammatory diathesis of another part, or of general fever, or by the communication, by continuity, of the inflammation from other parts, as we have often witnessed. Another, and not unfrequent cause, arises from flatulent colic, either neglected or improperly treated, which many times degenerates into inflammation of the bowels under such circumstances. Calcular concretions have also brought it on.

In treating for this disease, as for most of the other inflammations of important organs, it requires very energetic and early measures to be adopted. Indeed the treatment must here be still more prompt than in most other cases, as an instance of recovery seldom occurs where the treatment has been delayed beyond the second day. In fact, twenty-four hours of this disease frequently destroys the horse. Bleeding is the first thing to be done; and if the subject be young, large, and plethoric, six or seven quarts may be safely taken away. Should the symptoms, after this, continue unabated, the same may be repeated in four hours, to the amount of four or five quarts

VISCERA OF THE ABDOMEN OF THE HORSE.

1 Suspensory ligament.
2 The Diaphragm
3 The Liver.
4 The Stomach.
5 The Omentum.
6 The Spleen.
7 Pancreas.
8 Duodenum.
9 Aorta.
10 Vena Cava.



11 Vena Portarum
12 The Kidneys.
13 Vena Renalis
14 The Ureters
1515 Venæ Seminales.
1616 Ovarium
1717 Art Seminalis.
1818 Corona Enteris.
19 The Enteris.
20 The Bladder
21 Part of the rectum.

more; nor should even a third bleeding, though in a less degree, be omitted in other four hours, if the inflammatory appearances have not become mitigated. The bleeding may be known to have a salutary effect by the pulse becoming softer and fuller, particularly if it shows a disposition to rise as the blood flows. Here also it is proper that the blood be abstracted quickly, and from a large orifice.

As soon as the first bleeding is over, the animal should be back-raked, in order to remove any hardened dung that may obstruct the passage, and which, if suffered to remain, will infallibly aggravate the complaint, and, indeed, in many instances, is the cause of it. The distressing stranguary that sometimes accompanies inflammation of the bowels, is also, frequently, as much produced by the pressure of hardened excrement, as by anything else.

It is not the dropping away of a few balls of hardened dung, or the passage of some thin glairy matter, which shows that no obstruction exists; on the contrary, when these are present, a most obstinate costiveness may yet remain farther up in the passage; and a flow of thin fæces may escape by a groove, formed by the side of an obstructing portion of dung. Unless, therefore, there be an evident free passage to all the fæcal matter, and unless the excrement be wholly softened, it is always proper to rake; for it must not be lost sight of, that whether as a consequence, or a cause, constipation aggravates the disease, and is always present.

A complete recovery seldom, if ever, takes place, until these fæcal matters are removed. It is always of consequence to bear in mind, that as the state of the bowels, is such as not to render it prudent to allow of strong purgatives being given by the mouth, so the greater activity is required to empty them mechanically, and by the assistance of clysters, which should be thrown up very frequently. The next thing to be done is to raise a brisk external inflammation over the belly, to lessen thereby the internal affection; and, in this case, even cantharides are hardly quick enough in their action. A more speedy determination to the skin may be made, by first fomenting the belly with hot water for a quarter of an hour, and then by applying a large mustard poultice, farther liquified with oil of turpentine, or with the liquid blister (see *List of Medicines*), which may be spread on coarse linen, or a horse-cloth. What, however, is still more preferable, is the fleshy side of a newly stripped sheepskin, covered with it, and then applied close to the belly by means of flannel rollers, to retain it in its situation. When this has remained on for three or four hours, if an evident abatement of symptoms does not show itself, proceed to blister in the usual way. It next becomes a consideration as to what remedies may be given by the mouth, which must greatly depend on the degree of costiveness with which the animal is distressed. In a case where the obstruction does not appear obstinate, we should recommend that castor and linseed oils be given combined—six or eight ounces of each, shaken together, with a little gruel. When the bowels are more closely constricted, take of—

Solution of Aloes	2 oz.
Solution of Rhubarb . . .	2 do.
Good Gruel	1 quart.

Repeat this every three or four hours, till full evacuation is obtained. Before the costiveness is overcome, care must be taken not to increase the distension of the bowels with much liquid given by the mouth; but when a passage is obtained, take about three quarts of good oatmeal gruel, and the same quantity of linseed-meal tea. Mix these well together, and keep them constantly warm, and occasionally horn a little down; when consumed, repeat the quantity.

This must be the only food given to the horse until a decided amendment is apparent, when he may, by slow degrees, be brought into the use of his ordinary food; but this, at first, must be dealt out to him with a very sparing hand, lest the disease return, in which case it almost always proves fatal. In case the animal is very restless, a loose box would be the most preferable place for him; or, if situated in the country, where no such thing can be obtained, the bay of a barn, or even the floor, well littered down with straw, would be preferable to a stable or stall.

INFLAMMATION OF THE INTESTINES FROM SUPERPURGATION.

As the former affection consists of a phleg-

monous inflammatory attack on the peritoneal covering of the intestines, this is usually an affection of their villous surface, the consequence of the administration of improper purging medicines, either as to quantity or quality, by which such a state of irritation is produced as ends in inflammation. It is always accompanied with purging; whereas the former has almost always costiveness connected with it. Neither is the pain so acute in the latter; consequently the horse seldom exhibits so much uneasiness by rolling or stamping. The pulse is also quick and small, but seldom hard. If the symptoms of inflammation be very active; that is, if the pain approaches distress, if the extremities feel cold, and the pulse betokens much vascular action, three quarts of blood may be drawn; but, unless these appearances exist in force, it will be more prudent to omit it. Stimulants should, however, be applied to the bowels, as directed in inflammation of them; the clothing, also, should be warm, and means taken to keep up the circulation in the extremities by hand-rubbing and bandaging. The stable should likewise be kept warm, and the following drink given every four hours:—

Prepared Chalk	1½ oz.
Rice	2 do.

Boil the rice in three pints of soft water, until it is a complete *pulp;* then squeeze it through a fine cloth. Add the chalk to the liquor, breaking down the lumps, and give at a proper warmth. As before instructed, give every four hours. Should this not appear to relieve the animal, take of—

Laudanum	1 oz.
Gum-arabic	2 do.

First boil the gum-arabic, in rather more than a quart of good oatmeal gruel; then add the laudanum, and give as before directed. During the exhibition of the medicine, continue to apply clysters of rice and water, made as shown above.

INFLAMMATION OF THE LIVER.

The liver of the horse is, of itself, seldom the first affected with inflammation, though, when other great abdominal inflammations take place, it frequently participates in the disease.

The symptoms of this complaint generally commence in appearances not very unlike a slight attack of inflammation of the bowels; but they are unattended with that rising up and lying down, which, so frequently, is an accompaniment of the latter disease. Still, the horse will often turn his head to his right side, evincing considerable pain; and if his right side be pressed with the hand, he will make a peculiar grunting noise, indicative of suffering. If he be turned round in his stall, to the right hand, it will be with great difficulty, which will further show the pain he is labouring under. The extremities are generally cold; considerable heaving at the flank takes place; the pulse is quick and hard, and the mouth is hot, attended with a yellowness of the lining of the membrane which covers it. The nostrils and the *conjunctiva* of the eye also participate in this yellow tinge. These appearances, taken collectively, are the indications which lead to the discovery of this complaint.

The disease is frequently attended with costiveness; and in consequence of the secreted bile not passing off in its usual way, it becomes absorbed in the system; and hence that yellowness of the skin and of the finer membranes. Occasionally, a disagreeable morbid secretion is set up, and the horse's dung becomes loose, and remarkably black, attended with an exceedingly offensive smell. If the disease should terminate in violent discharges of the above-named black fœtid stools, the animal frequently falls a victim in a comparatively short time—not longer than two or three days.

For the cure of inflamed liver, first bleed to the full extent of the powers of the animal; and, if necessary, repeat in five or six hours. Well blister the sides of the belly; and if costiveness should appear, back-rake, and throw up clysters of salt and water every three hours; then take of—

Blue Pill	2 drachms.
Cape Aloes	3 do.

Form into a ball with honey;

and repeat every six hours until it operates.

In cases where purging has commenced, the bleeding should be more moderate and sparing, unless the inflammation run high; in which case discretion must be the guide in the mode of treatment to be adopted, for a repetition of

bleeding is sometimes here less advisable than in the former instance. Take of—

Linseed Meal	2 ounces.
Oatmeal	2 do.
Catechu Pul.	1 do.

Make into good gruel, with three pints of soft water, and give morning and night. If the horse appear weak, and much debilitated, take the following:—

Cape Aloes	6 drachms.
Sulphate of Iron	6 do.
Powdered Opium	4 do.
Blue Pill	6 do.

Form into a mass with honey;

and divide into six balls. Give one every second day.

INFLAMMATION OF THE KIDNEYS.

The horse is very liable to this affection, which is of such a dangerous nature, that if remedial means are not early resorted to, mortification may take place, and the death of the animal be the result.

The symptoms of this disease are various—the animal, for the most part, being dull; the urine also is made in small quantities, and is the colour of porter, and occasionally bloody. As the inflammation increases, the urine becomes sometimes wholly suppressed. He stands with his hind legs wide apart, as if attempting to stale; exhibits great thirst, and is frequently inclined to drink; but this must be guarded against. Diuretic medicine of every description must be carefully avoided, as tending to determine more blood to those organs than is necessary. The legs are apt to swell greatly, and there is a difficulty in moving him in the stall, from the pain which he evinces in his hind quarters. This disease sometimes arises from severe exercise, if taken with a heavy rider. Cold rainy nights will produce it, where the water lodges considerably on the region of the loins.

For the treatment, the principal sheet-anchor is bleeding plentifully, to the amount of from four to six quarts; and, if the inflammatory symptoms still continue for the space of four or five hours, bleed again. After the first bleeding, proceed to back-rake, and clear the rectum out well; then throw up clysters of warm water, until the bowels appear to have a free passage. A blister over the loins might do good; but here it is better avoided, as the active principle of the blister lying in the Spanish flies, may become absorbed, and, entering into the system, do considerably more harm than good; therefore use the following ointment:—

Tartar Emetic	2 drachms.
Hog's Lard	2 ounces.

Work well into an ointment, and apply to the loins, night and morning, until pimples make their appearance; then desist. Tie a cradle round the neck, to prevent him biting the part. Clothe moderately; bandage the legs; and for litter, give plenty of good clean straw. For drink, give gruel frequently, in small quantities; feed with hay of the best quality, and moderately; give half bran and half oats, made moist with *cold water*. Also administer the following every morning:—

Antimony Pul.	12 ounces.
Brimstone Pul.	4 do.
Cape Aloes	12 drachms.

Mix with honey, to form a mass;

and divide into twelve balls. Give one every morning, the first thing.

INFLAMMATION OF THE BLADDER.

The bladder may become inflamed throughout its whole body, or the affection may be confined to the neck of it only; and as different symptoms arise, as either the one or the other of these are the immediate seat of disease, so we shall describe them separately.

When a mucous membrane is inflamed, it ceases to secrete mucus. This takes place in the inflammation of the internal coat of the bladder; and when it ceases to secrete the irritable portion of mucus, it is constantly endeavouring to rid itself of it.

This complaint may be distinguished from inflammation of the kidneys, by what has been said with regard to that disease; and from inflammation of the neck of the bladder, from what follows.

As the inflamed bladder cannot long retain its contents, so there is a frequent evacuation of a small quantity of urine; and, on passing the hand up the rectum, the bladder will be found hot and tender, but empty. The horse will also be observed to have a disposition to dung frequently, as well as to stale, from the sym-

pathy of the rectum with the bladder. The fever is generally considerable, and the pulse is harder and fuller than natural; but as the disease proceeds, it usually becomes oppressed. Its *causes* may originate in the translation of fever; perhaps sometimes by cold, alternating with heat; and it has been occasioned in mares, by passing some irritating substance up the urethra, to excite them.

Sometimes inflammation of the bladder terminates fatally, in consequence of mortification; but if mucus be again secreted, there is every hope that all things may terminate well, a complete restoration effected, and the animal, after a time, be as capable of performing his duties as ever.

For the cure, bleed according to the height of the fever; and, if no alteration take place for the better, bleed again, as the pulse may indicate; back-rake, throw up clysters of warm water, holding the tail down firm, to prevent their speedy rejection. However, if such should be the case, have ready plenty of hot water to continue the injections, as in this case they act as fomentations to the bladder, and thereby greatly tend to relieve it. For internal remedies, give the same as in the preceding article.

INFLAMMATION OF THE NECK OF THE BLADDER.

Sometimes the neck of the bladder takes on inflammation alone; and this occurs more frequently to horses than to mares.

It is to be distinguished from inflammation of the kidneys, because, in passing the hand up the rectum, the bladder will be found distended. This will also prevent its being mistaken for inflammation of the body of the bladder. The frequent making of a little water will not, however, distinguish either of the foregoing complaints from this, as, in inflammation of the neck of the bladder, there is sometimes a small quantity of urine evacuated at different times; for, after the bladder is distended, there will be, by the force of the distension, a few drops now and then squeezed out. In this disease, however, frequent staling will not take place until the bladder is fully distended; whereas, in the former disease, it will come on at the very first; and likewise in the latter case, the distended bladder may be felt even by the belly. The treatment of this disease is so very much like the two preceding cases, that a repetition of them is here quite unnecessary.

CHAPTER XXXIII.

MORBID POISONS.—HYDROPHOBIA; BITES OF REPTILES; VEGETABLE POISONS; MINERAL POISONS; STINGS.

HYDROPHOBIA.

This disease seldom attacks the horse; and when it does, it arises from the bite of some other animal; such as a dog, or cat, that may be allowed to remain in the stable.

We never saw more than two cases of madness, and those were frightful enough. The first was in a large bay carriage animal, which occurred at the Royal Veterinary College. The symptoms which made their appearance first were, his refusing all kinds of food and water; he was then taken with a kind of shivering fit, after which he broke out into a profuse sweat, stared vacantly around him, began to be extremely restless in his stall; and was then placed in a loose box. No sooner was he placed there than he began to roll and tumble about, reeling and staggering from one side of the box to the other; biting at the manger and rack with the greatest violence; biting his own sides until they bled, and raising his fore feet as high as he could. Indeed, the sight was terrifying to behold; foaming at the mouth, with eyes glaring and glassy. From the

agonising torment the poor animal was in, he was left for a short time; but on returning to the box, he was lying on the floor, completely exhausted. He was immediately ordered to be destroyed.

The most satisfactory symptoms, in cases of this kind, is the dread of water which the horse usually exhibits. Professor Dupuy gives us an account of this circumstance:—"A rabid horse was confined in one of the sick-boxes. His food was given to him through an opening over the door, and a bucket was suspended from it, and supplied with water by means of a copper tube. As soon as he heard the water falling into the pail, he fell into violent convulsions, seized the tube, and crushed it into pieces. When the water in the bucket was agitated, the convulsions were renewed. He would occasionally approach the bucket, as if he wished to drink; and then, after agitating the water for an instant, he would fall on his litter, uttering a hoarse cry; but he would rise again almost immediately. These symptoms were dreadfully increased if water were thrown upon his head. He would then endeavour to seize it as it fell, and bite with fury at everything within his reach, his whole frame being dreadfully convulsed."

Mr. Youatt says, that if a horse is bitten under suspicious circumstances, he should be carefully examined, and every wound, and even the slightest scratch, well burned with the lunar caustic (nitrate of silver). The scab should be removed, and the operation repeated on the third day. The hot iron does not answer so well, and other caustics are not so manageable. In the spring of 1827, four horses were bitten near Hyde Park, by a mad dog. To one of them the lunar caustic was twice severely applied—he lived. The red-hot iron was unsparingly used on the others, and they died. The caustic must reach every part of the wound. At the expiration of the fourth week the horse may be considered to be safe.

The other case was that of a cart-horse, the symptoms of which were so very like the preceding, that they need little or no description; the horse having been shot after the attack had been on him about three hours. To prevent such cases, no dogs should be suffered to sleep in stables.

BITES OF REPTILES.

Reptiles frequently inflict fatal wounds; but in this country the adder is the only one that we have known to bite either horses or cattle; and when this occurs, and is attended with swelling, take of—

Oil of Turpentine	2 oz.
Olive Oil	4 do.

Mix, and rub a portion of the liniment on the parts affected, morning and night.

VEGETABLE POISONS.

Of this class of poisons we have only the yew-tree that produces any particularly deleterious effects upon horses; and when this is once eaten, the animal wastes away by degrees, until death puts a period to his sufferings. Two horses that had been employed in carrying fodder, were thoughtlessly placed under a large yew-tree, of the leaves of which they eagerly partook. In three hours they began to stagger; both of them dropped; and before the harness could be taken off them, they were dead. On being opened, a large quantity of yew-leaves were found in their stomachs, which were contracted and inflamed. The water-dropwort; the water-parsley; the common hemlock; euphorbium, or spurge; colocynth; elaterium; bryary root; savoin; and common brake, are all classed among the vegetable poisons; but there is little danger of the horse hurting himself by them.

MINERAL POISONS.

The numerous minerals given in veterinary practice, do not produce the same poisonous effects which might be anticipated from their name and properties, and which they appear to have when given to the human subject. Arsenic and corrosive sublimate are both used in veterinary practice; but, in all probability, the former will soon disappear from the medical list.

STINGS OF HORNETS.

These are very annoying, and are frequently the cause of much pain and irritation to the horse. We have heard of a horse being attacked by hornets, and stung until the inflammation occasioned proved fatal. The best

application in such cases is vinegar, which put on the inflamed parts, two or three times a day. The spirit of turpentine is also good, and, if administered with discretion, and a proper regard to quantity, mixed with a certain proportion of oil, may be beneficial.

CHAPTER XXXIV.

DISEASES OF THE FEET.—THE FOOT IN GENERAL; CORNS; INFLAMMATION; CONTRACTION, OR NAVICULAR DISEASE; GROGGINESS; PUMICED FOOT; THRUSH; SANDCRACK; PUNCTURED FOOT; OVERREACHING; QUITTOR; CANKER; FALSE QUARTER.

THE FOOT IN GENERAL.

WHOEVER has seen the anatomy of the horse's foot, must acknowledge it to be one of the finest pieces of mechanism ever fashioned by Nature. It ought to form a part of the study of every man who keeps a horse; and if those lovers of horses, the country gentlemen, were well acquainted with the anatomy of the foot, they would, themselves, have an opportunity of preventing the many errors committed by bungling farriers in the shoeing of their horses, and the veterinary surgeon would receive less blame than sometimes falls to his lot. For example: the veterinarian is supposed to be proprietor of a *shoeing forge*, with several workmen; and, above all, he is supposed to have a *foreman*, to see that all *shall* be right. What is the consequence? A gentleman sends for the surgeon, and informs him that his horse is ill-shod at his establishment, and he scarcely can ride him, he stumbles so. The consequence is, that the surgeon orders him to his forge, and promises he will see and attend to the shoeing himself. He does so, and the shoes are taken off, and in all probability their having been nailed on too firmly is the cause of all the evil. This being attended to, under the master's eye, immediate relief is given, and the horse is sent away with satisfaction. But how is it that neither the foreman, nor any other of the workmen could discover this, but the master alone. Now, if the master have any medical practice, he cannot be in two places at once. Therefore the shoeing department must be left to the foreman, who, unfortunately, frequently understands as much about the matter as the piece of iron he is working on; but, in case of a repetition, the surgeon gets the blame; and, in all probability, he stands a chance of losing an employer. Many persons would say, "How is this; the man has shod horses for these twenty years, and he ought to know?" An easy answer follows: "Does he know the anatomy of the horse's foot?" "No; I am not aware that he does."

But to return to the foot. It will not be necessary to advert to the anatomy of that important organ. Our business is to point out its various diseases, with the best means of cure, which we shall endeavour to do; and as corns are so common, we shall treat of them first.

CORNS.

Corns originate in an injury done to one of the most vascular parts; and itself is equally vascular, and instead of tending to increase the cuticle (*i. e.*, the horn) over it, derives its principal character from being inimical to every future growth of it. These very troublesome affections arise from injury done to the vessels of the sensitive sole, exactly at the surface of union between it and the horny sole, whereby blood becomes extravasated within the angle of the inflexions of the heels; that is, between the outer crust and the bars. They appear, in every instance, the effect of improper pressure, by which the sensitive vascular sole becomes acted on between the horny sole and the heels of the coffin-bone. This disease is equally produced, whether the pressure arise from the horn of the sole, or the horn of the walls; and it is from the pressure of the walls

of the heels bruising the sensitive sole, that corns are so common to contracted feet, and also to weak hoofs. It is also to the increased weakness of the inner wall and heel of the hoof that corns are so much more frequent in the inner than the outer heel; and it is from the superior strength of the hinder heels that they are less liable to them. But though the contraction of the walls of the heels does often occasion the complaint, it is much more frequently the consequence of pressure of the sole, the very form of which shows that it never was intended to be thus acted on; for the crust meets the ground, and the sole recedes from it in every part. The general mode in which injurious pressure is given to the sole, is either by an improper form of the shoe applied, by not removing the horn opposed to the seat of corns, or by neglecting to renew the shoe at proper intervals. To one or other of these errors most corns may be attributed.

Bad shoeing operates in various ways, but in none more commonly than by the thickened unequal heel of the shoe, which is, in general, formed into a sort of clubbed end, that prevents its presenting a level surface towards the foot; on the contrary, a bulbous projection *indents* itself into the very part, as though purposely placed there to produce this injury. The custom, also, of making the seat of the shoe slant, or level inwards, is, we believe, sometimes productive of corns; but the heel, for nearly an inch before its termination, should be made perfectly flat, and the same thickness as any other part of the shoe.

Neglecting to prepare the foot for the shoe is also a fruitful source of corns; for that part of the horny sole which fills up the acute angle, between the crust and the bars, the pressure on which is so injurious, is, in a state of nature, protected by the prominences of the frog and bars, as well as by the inclined direction of the latter; but as artificial habits alter the shape of the foot, this part becomes exposed. Therefore, in preparing a foot for the shoe, this angular portion should be so pared as to remove it from contact with the iron, without weakening the horny covering of the sensitive sole. For so surely as this part becomes subjected to pressure for any considerable length of time, so surely extravasation will take place, and a corn be formed, all the more rapidly if the heels are weak.

The third common cause is the neglect of removing, or renewing, the shoes at proper intervals. When a shoe has been long worn, the growth of the hoof carries it forward, by which the parts originally opposed to the heels are carried beyond them, and now press on the sole, often becoming indented within the line of the crust, and producing a most injurious pressure. Sometimes, also, either from the original form of the shoes, or by long wear, they become loose and "*springy*," as smiths call it, at the heels; in which cases gravel is apt to make its way between the shoe and the foot, and, by the pressure of the heels during action, is indented into the substance of the horn. Other gravel is received in the same manner, which presses the first still onward, till at last it meets the sensitive part. As soon as this takes place, inflammation ensues, and a very different complaint is formed to that of common corns; for in every instance of this kind, suppuration proceeds, and the matter, unable to make its exit below, or sideways, forces its way upwards, and a small tumour appears at the coronet, which breaks, and discharges a purulent matter.

But the common effect of pressure from long-worn shoes, is the extravasation of a little blood; which, on paring away the horn at the angular point of the heel, or heels, appears as a black or red speck, as it may have been longer or more newly thrown out from its vessels; and it may be followed with the paring knife to its source in the sensitive part. If the injury has been considerable, this blood itself may irritate, and, similarly to gravel, produce suppuration. In general cases, however, this extravasation remains unchanged; and, unless attended to, a weakened action of this part of the sole becomes permanent, and blood continues to be thrown out ever after, upon any occasional renewal of the pressure. In such cases, the horn itself, over the part, proves a source of future irritation; therefore, horses with old corns, only go well when fresh shod and their hoofs are newly pared; for as soon as the portion of sole between the bars grows to a level with the surrounding horn again, the sensitive sole receives a fresh bruise, and lameness once more appears. It

is by contemplating this possible termination of corn, that the law has wisely considered every horse with this complaint as unsound.

In treating for corns, when they first appear, it is not difficult, by proper means, entirely to remove them; but when they have existed some time, the injured parts become weakened, and the diseased action of throwing out blood, instead of secreting horn, becomes characteristic of them. As soon, therefore, as corns are discovered, the cure should be immediately attempted; first, by removing, with a fine drawing-knife, every portion of diseased horn around, and the whole of the extravasation likewise; avoiding, however, the wounding of the sensitive sole underneath. Having done this, take a pledget of tow, and well moisten it with compound tincture of myrrh, over which put tow sufficient to fill up the hollow of the foot; put on a bar-shoe, and secure the tow in the hollow of the foot by two sticks, laid across each other, and fastened underneath the edge of the shoe. This will act on the sensitive sole, by destroying the unsound parts, and by stimulating the remainder to a healthy secretion of the parts to produce new horn. Change the dressing every day, and care must be taken not to let the foot get wet. In this way corns may be permanently cured, when not of too long standing.

When the derangement of this part of the sole, however, has become habitual and permanent, a *palliative* treatment only can be pursued. In the first place, the pressure of the horn must be guarded against, by a regular and frequent paring-out of that portion between the inflexion of the heel; and if the hoof be very strong, and at all disposed to contract, the quarters also should be attended to, and not allowed to become too high, or too thick. We have also, in very strong feet, found the use of a short shoe sometimes of the greatest service; but, to a weak foot, either a chambered or a bar-shoe is preferable. When the weakness is very considerable, or the corn a very bad one, a bar-shoe will be found the best support, and should be constantly used; remembering, in those aggravated cases, to remove occasionally all the surrounding horn likely to press on the injured part; at the same time, taking care not to let the frog rest continually on the bar of the shoe, or it may be apt to bruise it. Whenever such a horse is shod, it is proper for the corn to be dressed with some active stimulant; such as tar, well rubbed in, and covered well with tow to keep the wet and moisture from it. By doing this regularly when shod, and about once a week also in the intermediate time, we have rendered horses, before useless, able afterwards to work with comfort to themselves, and satisfaction to their owners. In slight cases of corn, the shoe proper to be used is one of rather more substance than common, with the web a little wider than usual, and its width equal throughout; that is, as wide at the heels as at the toe. It should also extend to the termination of the heel, and no farther, and be well laid off the quarter, which is, generally, the inner one. This will allow the quarter to expand; and, in all probability, prevent a repetition of the pressure from the bone above. This shoe will afford ease and protection. Future pressure must be avoided by keeping the seat of corns clear from offending.

ACUTE INFLAMMATION OF THE FEET.

Of all the definite and well-marked diseases incident to the horse, this has been most mistaken among the old farriers, and the least noticed among the modern. In many works on Farriery it is not even mentioned; and, in most, is little more than hinted at.

This is almost unaccountable, as it is a disease that is very common among horses. When this disease has come under the notice of the common farrier, he has considered it to be a disease of the chest, in consequence of the horse resting his fore legs, because of the muscles and cellular membrane having become absorbed and wasted away. Hence has arisen the name of *chest-founder;* and most of the applications were made to the chest of the animal, instead of his feet. It frequently happens that metastasis takes place, or translation of fever from one part to another, as in inflamed lungs, &c. The feet then frequently become affected, whilst the lungs become relieved. In some cases obstructed perspiration will produce it, from sudden alteration of temperature, and standing a long time in the stable, especially if it be kept immoderately warm. The vessels of the feet not being able

to bear the sudden alteration, distend; and inflammation becomes the consequence. In many cases it occurs prior to an attack of symptomatic fever; both diseases being frequently occasioned by long-continued exertion, particularly on hard roads, with subsequent exposure to cold. Under such circumstances, inflammation of the feet may be confined to one foot, or two; or it may attack the whole four; but it is more common to the fore feet.

When a horse labours under inflammation of the feet, persons in attendance on him cannot discover quickly the seat of disease; consequently, he continues to get worse and worse, until a veterinary surgeon is called in, when it is found that the horse is breathing with difficulty, and, in all probability, is in a profuse sweat. The groom then informs him that the animal has been labouring under a severe shivering fit, frequently lying down, stretching out all-fours, and groaning with intense pain. The practitioner soon discovers the seat of disease from the peculiar manner in which the horse stands. He also discovers a singularity in his shifting and lifting up his legs; standing, by drawing his hinder legs under towards his chest, to relieve the fore legs from the weight that is naturally upon them. The practitioner will, however, be commonly saved the trouble of much doubt in his examination, for he will, in general cases, not be called in till the features of the complaint are sufficiently developed, by the utter impossibility to make the horse remain on his legs. On the contrary, when forced up, he will lie down again almost immediately, exhibiting every symptom of distress and uneasiness.

As soon, likewise, as the complaint has risen to any height, the feet will be found intensely hot, and the pastern arteries pulsating very strongly. These symptoms alone will serve to mark the disease. There is sometimes a little tumefaction around the fetlocks; and when one foot is held up for examination, it gives so much pain to the other, that the horse is in danger of falling. The poor brute groans and breaks out into profuse sweats, to be succeeded by cold fits. His eyes are moist and red; and his whole appearance shows that he is labouring under a most painful inflammatory affection.

In this state the complaint exhibits itself the first two, three, or four days, after which its effects are various. In the worst cases, when the symptoms we have stated have evidenced themselves a few days, a slight suppuration of the hoof, at the coronet, may be observed. From this may be pressed a small quantity of reddish ichor, or thin matter.

This inflammation, however, is not sufficiently active to force off the hoofs, which have, in a great measure, gradually become imperfect, and sometimes deformed. This imperfect resolution may be known before its effects on the horn have become apparent, by the very peculiar gait the horse has when taken out, and which once seen, can never be forgotten. His manner is to throw his feet forward in a seemingly burlesque style, and bring them down with an odd action on the heel. In fact, he clearly shows that he has lost the proper sensibility of his feet. In other cases, again, of imperfect resolution, the laminæ, losing their elasticity and power, yield to the weight and stress of the coffin-bone, which becomes pushed backwards, and, in its passage, draws with it the anterior crust of the hoof, which thus falls in. The pressure also of the coffin-bone destroys the concavity of the horny sole, which, instead, becomes convex or pumiced, leaving a large space towards the toe, filled with a semi-cartilaginous mass, which is not the unfrequent termination of inflammation of the foot.

When the attack is not commenced with extreme violence, or when an early and judicious treatment has been adopted, the inflammation becomes easily removed, and, in the end, the animal will recover the use of his feet.

In treating inflammation of the feet, there is but one certain path to pursue; and that is, on first discovering it, to bleed largely, to the extent of six quarts, at least; and give cold bran mashes, and prepare the horse as for a dose of physic (see *List of Medicines;* where you can select a ball of any strength, according to the size or power of the animal). The next object is to attend to the feet themselves.

After removing the shoes, pare the feet out nicely, to as great an extent as they will admit; which will not be very much, in consequence of the hardness of the sole, produced by the inflammation. This done, rasp round the foot and the edges of the wall, so that a shoe may be lightly nailed on when required. This

being finished, bleed each foot largely at the toe; then lightly nail on the shoes (after sufficient blood has been taken from the feet), and place a pledget of tow on each orifice. Over all place a poultice of cold bran, made wet with water; and frequently have cold water squeezed over it from a sponge. In addition to this, apply to the fetlock-joint, what is now termed a "swab" (to be bought of any of the saddlers); but, in case this cannot be done, take a piece of coarse woollen cloth, of sufficient width to go round the leg, and of sufficient length to hang down over the hoof. This must be constantly kept wet with cold water. Sponge-boots we do not approve, as they are apt to induce "thrush," or at least make the frog so rotten, that in mending one hole another is made. The horse should not be encumbered with much litter, unless behind, for his fore legs to stand on; and what is given should be made wet with water. By this means he will have an opportunity of cooling his fore legs as much as possible; and should he be inclined to lie down, which in the early stages of the disease he may, the litter behind will prevent him from injuring his hips or his hocks.

Should the febrile symptoms not seem so speedily to abate as may be desirable, bleed again from the jugular, to the amount of four quarts. An opportunity will now be obtained of gently moving the horse about, which will enable a judgment to be formed as to whether there is any amendment in his feet. If so, the dressing must be continued as before; bearing in mind, that the orifice made in the foot will occasion some degree of lameness.

If the lameness, however, should still appear to be greater, or not at all relieved, bleed in both plate-veins, abstracting about two quarts from each vein; but do not even think of blistering the coronet, though we know that some practitioners are favourable to this. Give another dose of physic, which is better, in these cases, than all the blisters in the world. By adopting these cooling remedial measures, an amendment both in the feet and the constitution of the horse will be perceived. This, like all other diseases of the feet, will require care and attention, even after the animal has got apparently sound; and will be productive of good. If, while at grass, he should lose his foot-stopping, let it be immediately replaced.

CONTRACTED FEET; OR, THE NAVICULAR DISEASE.

Contracted feet is a disease that has been long known; and "navicular disease" arises, nine times out of ten, out of the former, or is occasioned by it.

Contracted feet are those which have the horn of the crust lessening the natural size of the foot, and pressing upon the sensitive parts within, and thereby causing pain and lameness. This occurs principally on the inner quarter of the crust, because it is the weakest, or thinnest of the two, and is generally the consequence of *bad shoeing*. There are other causes, however, which contribute to inflammation of the feet; such as too hot stables, and standing on hot dry straw, with little exercise to put the feet into action.

The navicular disease proceeds in a great measure from contracted feet; for, as before observed, as the horn of the crust presses on the soft and sensitive parts within, so the elastic parts become fixed, and the multiplicity of these parts contained within the hoof get diseased, in consequence of being squeezed up, as it were, in a vice: the coffin-bone, the navicular bone, and not unfrequently the small pastern-bone, all become more or less injured.

The reason why the navicular bone is more subject to disease than either the coffin or the pastern-bones, is in consequence of its attachments, and the work it has to do. Every time the horse raises his foot, this bone ascends also, and descends when he puts his foot to the ground; the flexor-tendon, also, being fixed into the coffin-bone, and the navicular bone immediately above it, the small pastern-bone working immediately above that, the whole of the weight of the animal is thrown upon this bone. We ask, then, how can this bone perform its proper functions, when prevented by contraction of the horny box, or hoof, in which it is contained? Of course, any person of common sense will answer, "it cannot!" Hence arises the complaint called *navicular disease*. We have mentioned that the small pastern rests on the navicular bone. In consequence of the confinement of these bones, their action is not free; and the lower end of the small pastern-bone chafing against the

navicular bone, sets up inflammation, and the horse goes lame. It unfortunately happens, however, that the poor animal, especially if he is a harness-horse, is still doomed to suffer until the inflammation runs so high, that the absorbents commence their work by removing the fine membrane with which the navicular bone is covered, and absorbing the gristly covering also. The inflammation still being kept up, the bone becomes affected, and caries, or mortification, may take place; and then the navicular disease has arrived at its height.

The principal causes of these diseases we believe to be bad shoeing; though in going over our subject, we shall, in all probability, mention others of a minor nature.

The old-fashioned method of preparing and rasping the feet, has occasioned more lameness than any one thing; for what with paring the frogs away, and opening the heels, as it is termed, with scarcely touching the sole of the foot, was enough to produce contraction; added to which, there was the accompaniment of a very high-heeled shoe. These means, with a little thought, will immediately explain to the experienced horseman, why the feet of his animal become contracted.

Owners of horses are sometimes to blame in not having their feet pared frequently enough. If the horse should wear his shoes rather light, they will let him go as long as six weeks without paring, and even longer; not thinking of the injury the foot is, all this time, sustaining by its improper growth. No man should let his horse go, without removing the shoes, longer than a fortnight, and new shoes should be put on every month. An opportunity is then given both of examining and paring out the feet properly, and watching that they do not grow out of form; but the custom of nailing the shoes on so exceedingly tight, particularly where the crust is not strong, must affect the feet, and prevent the ordinary expansion.

Shoes of a bad form are very hurtful, except it be for slow-working cart-horses, which have feet of all shapes.

Thick-heeled shoes are sometimes the cause of contraction; but we have seen thin-heeled shoes produce it, by constantly bearing too much on the frog. Still, a moderate bearing on the frog is highly necessary. But there are so many strangely fashioned feet which pass through the hands of a smith, that it is next to an impossibility, unless he be a clever fellow, for him to know what kind of shoe is the best to be generally adapted to them.

We have read of authors wondering how it was that farm-horses had such fine open feet, when they are the worst shod, and mostly with high calkins; but we think the matter is easily solved, when we reflect that their feet are kept open from pressure below; and, though they may have high calkins, and the frog considerably cut away, it is forgotten that the rough land they have to plough, or harrow, perhaps is in balls, the size of large potatoes, all acting as so many expanders while the horse is going over them. Again, if the weather be wet, and the soil damp, this keeps the feet cool and moist; and, of course, renders them more susceptible of expansion.

Artificial heat has a great tendency to produce contraction, especially in hunting-stables, where horses are kept in the highest condition; also, in racing-stables, where they are kept on good dry litter, half-way up their legs, and every hole and crevice stopped to prevent the least air from coming in. The heat that is thus generated, dries up the hoof, and necessarily disposes it to contract.

Heat also, applied by the shoeing smiths, will produce it, if not discontinued; for heat, as they apply it to the foot, has a different tendency during the actual time they are applying it, from the gradual *continued* heat of the stable. Moisture, on the other hand, has a directly opposite effect, its application greatly tending to counteract the contractile disposition. It also softens the hoof, and assists the weight of the horse in expanding the foot; but sometimes, from the extreme thickness of the hoof, it will not even yield to moisture. In the natural state, it is well known that the hoofs must be accustomed to considerable moisture, of which they are mostly deprived in artificial life. A horse confined to the stable, frequently does not get his feet moistened once a day; but in a state of nature, half his feet may be said to be exposed to moisture half his time, either from dew, or from being immersed in rivers or ponds. Farmers' horses are much more bene-

fited than many others, most of them being generally turned out, and therefore less subject to this disease; though, certainly, the cutting away of the frogs and bars more than is necessary, is the principal cause of contraction in them. Long standing in the stable will frequently produce it, more especially if one foot happens to be lame, which will frequently become contracted from the want of the necessary and natural weight to preserve it in a state of expansion.

The symptoms of contraction of the foot, and navicular disease, are seen in the hoof becoming lengthened; and the frog, instead of having that fullness seen in the natural frog, appears squeezed between the heels, and is not unfrequently ruptured. The feet of all horses do not in contraction become lengthened; but where the heels are very weak, the inside heel may be observed, on standing immediately behind the animal, to turn-in remarkably sharp. When this is the case, horsemen term it being *wired in*. Sometimes the contraction is principally perceptible round the coronet; but this arises when the disease is subsequent to inflammation of the feet, and the usual secretion at the coronet goes on, but an unhealthy secretion becomes set up. This, however, is not a common case, as contraction generally begins below.

The hind feet are seldom or ever very liable to contraction; and when that does take place, it is not attended with those serious consequences which result when the disease attacks the fore feet, little attention being required to restore them.

The horses of dealers are very liable to contraction, from being removed from the cooling pasture of the farmer, and then travelling, perhaps, from a hundred to a hundred and fifty miles, to be immediately placed in a hot stable. These animals, if their feet are not kept moist, are sure to go lame in the course of a week's time. Contracted hoofs are almost always produced by the causes already detailed; and the general concavity of the sole, with the thickness of its substance, greatly adds to the pain usually felt in progression. From the pain the horse is in during his standing in the stable, he sometimes puts one leg before the other, the most painful one being generally pointed under the manger. This, by horsemen, is termed "*pointing*, or *fencing*," and is a certain sign of the disease. Such an animal, when going on the road, is always inclined to canter; for, if in a walk, or trot, where one fore leg is in the air at a time, it is ten to one but the weight of his rider brings him down. Whenever, therefore, this is observed, however free from lameness he may appear, such feet are diseased; and frequently, on close inspection in these cases, a shortened step may be detected, and a sudden drop of the knee, or fetlock joint, termed "*going feelingly*," as though he were passing over hot bricks; for such horses seldom or ever step true, but always trip, or stumble.

Nor can we wonder that lameness should be the consequence of contraction, when we consider how exquisitely sensitive are the internal parts of the foot, and how completely they fill up the cavity, which, being lessened, must subject the other parts to pressure, between the hard substances of the coffin-bone, the walls, and sole. Inflammation frequently goes on to that extent, that a deposit of coagulable lymph takes place between the laminæ, and sometimes over the sensitive sole, which, in a great measure, destroys its natural sensibility. This is called, by the old farriers, "*numbness*" of the foot; but this is not the end of the matter, for the inflammation will extend to the bones and cartilages; and while the former throw out bony matter, the latter will become absorbed, and bone be deposited to supply their place. This necessarily produces great lameness and pain to the poor animal.

In treating for this disease, we must observe that feet are of such variety, that a general prescription would not be of much use; but, as we have said that contraction may arise from external as well as internal causes, in many cases palliatives only can be administered. Fortunately, however, where internal derangement has not taken place, although the pressure may be great, and considerable lameness ensue, still the ill effects are not of a lasting nature; for by enlarging the hoofs, the pressure may be removed, and the pain mitigated or entirely taken away. No means, of course, would be equal to a perfect cure; and consequently it would not be wise to recommend a tedious and expensive process, when a palliative mode ought to be adopted; but in the

latter case, a perfect cure may follow a judicious mode of treatment, and therefore these circumstances should not prevent us from trying it. If the contraction has not been of long duration, by proceeding slowly and carefully, this object may be obtained, and particularly if the cause of the disease is ascertained, and if there is every reason to believe that the internal parts are not materially affected.

There have been invented, by many ingenious and clever veterinarians, a variety of mechanical contrivances to remove contraction of the foot; but few of them have been attended with permanent success, though, in some instances, they have afforded temporary relief; but as soon as they were removed, the foot contracted much faster than before.

All these are now done away with, and a more simple and effectual plan has been adopted. This is by applying moisture, and having more regard to shoeing. In extreme cases the operation of neurotomy must be performed. In cases of contraction, take blood from the plate-veins—say two quarts from each—and administer alterative medicines every other day. (See *Medicines*). Apply swabs, or woollen cloth, round the hoofs, as directed in the last article, always kept wet with cold water; then direct the farrier to pare out so much of the sole as will cause it to yield to the pressure of the thumb. He must be careful not to remove the bars, or any part of them. The frog likewise must not be cut away, except such ragged parts as may be injurious. The heels may now be rasped down, until they are as low as the crown of the frog, if they will admit of it; if not, as close as possibly can be done. This being accomplished, place on an old thin shoe, with but one nail in the inside, so that it does not press on the inner quarter. Remove all bedding, excepting a little every other night, as the more he stands, the quicker will be the expansion. Give him cooling diet, such as half bran and oats, made tolerably wet; carrots, or clover, grass, &c., &c. Continue this treatment for a week, and watch the progress of it; and, if he should not be particularly lame, let him be exercised two hours, morning and night.

At the Royal Veterinary College, there is an ingenious contrivance to apply moisture to the feet: the floor is taken up where the fore legs of the animal would come, and the earth is removed. The paving is then replaced, and cemented, so as to be water-tight. The horse is then led into this standing, where he remains a considerable time, up to his knees in water. The object of this is to apply continual moisture, adding pressure at the same time; for the moisture must be accompanied with pressure, or the end will not be answered. It is with a view to this purpose that we would order four hours' exercise per day in this disease. Many persons are fond of scoring the hoof at the quarter, with a fine drawing-knife, so that it may have a hinge-like action; but this is of no service without the application of moisture, for the scorings become so dry, that they make the matter worse than it was.

Supposing every resource to have failed in the successful treatment of this disease, we must, at the last, have recourse to excising a portion of the pastern nerve, which is termed *neurotomy*. This is the only remedy in extreme cases, which are then termed the *navicular disease*. How to perform this operation we will describe when we come to the subject of *Operations*.

GROGGINESS.

Groggy feet, by stablemen and grooms, for a length of time, used to be considered an inflammation of the laminæ; but, since the anatomy of the horse's foot has become known, it has been discovered to be an inflammatory action going on in the articulating cartilages and their membranes; also in the ligaments connecting the large and small pastern bones, which have sometimes been corroded, and in such a state of disorganisation, as to tend to a bony deposit, and eventually to anchylosis, or stiff joint. We know of no treatment likely to relieve the parts but firing, and repeated blistering. In this complaint the horse will go upon his toe, the joint immediately within the hoof being stiff. Many working animals in London are affected with this disease, the poor animals sometimes being so excessively lame, as to excite the commiseration of every one who sees them. Professor Stewart, in his *Stable Economy*, says, "that it is common among all kinds of fast workers; and

long journeys at a fast pace will make almost any horse groggy. Bad shoeing and want of stable care may help to increase, but never can alone produce grogginess. It is one of the evils of excessive work." In most cases it admits of no remedy.

PUMICED FOOT.

Pumiced foot is a morbid secretion of the sensitive laminæ, which forces the hoof from those laminated parts which cover the coffin-bone, so that a partial separation takes place between the two, whilst an inflammatory attack goes on slowly and gradually. This may be observed by the front of the hoof giving way, or falling in, and receding from its usual obliquity; the sole also, at the same time, becoming nearly flat. This is the time that the horse begins to falter, and show lameness, especially if going over newly-repaired roads; when, if he should tread on a sharp stone, it will probably be with difficulty that he will save himself from coming down. From this curious disease, he appears to secrete little or no horn for the shoe to lie upon, which makes feet of this kind exceedingly difficult to shoe; and still, what appears strange, the sole becomes thinner and thinner, and at length bulges out, forming a perfect convex. This convexity becomes greater, or less, as the disease is more severe. Large cart-horses are very subject to pumice, especially those used in large towns, where they are continually battering their feet on the stones, producing a slow inflammation, ending in pumiced feet from irritation.

The pressure which the coffin-bone, thus displaced, makes on the fleshy sole, sometimes causes an absorption of its own edges, but always an interruption to the healthy secretion of horn. The sole, therefore, being unable to bear the weight of the animal, as it would be in a healthy state, loses its concavity, and yields to the altered form of the parts above it. The whole of the parts within become deranged in structure, as well as situation, and the receding of the coffin-bone towards the heels, where it rests, produces an altered line of declivity.

Palliatives are the only means by which this sort of feet can be treated with any degree of success. A cure is impossible, as the parts can never be reinstated in their original form. Here, shoeing is the principal remedy; and, with this properly done, we have known many horses with pumiced feet work well for a considerable time. With regard to the shoeing, particular attention must be paid to the thinness of the wall, or crust; also, the sole being so exceedingly thin, in putting on, the greatest care is necessary, that no part of the shoe bears thereon. Most smiths are acquainted with the kind of shoe that is best for pumiced feet, it being rather a peculiar one. The framing of this shoe is with an exceedingly wide web, and made thick enough to be, what is called, chambered out very much, almost covering the sole altogether. This is done in order to prevent stones, &c., from injuring the sole of the foot. This shoe should be carefully nailed on, with more than the usual number of nails; but allowance must be made for the extra number in the size, as "*fives*," or "*sixes*," will be sufficiently large. This sort of shoe we have found generally to answer exceedingly well; but where it has not answered, we have placed on a bar-shoe, and shouldered it down at the quarters, so that it did not touch the crust, or heels behind. From the form of this shoe, we have seen great benefit arise. After having it placed on, the sole and crust should be well smeared with the following:—

Alum pul.	2 oz.
Tar	3 do.

This application, occasionally used, will harden the hoof and sole; for moisture, in this disease, must be strictly avoided; and horses so affected should never be turned out to grass.

A similar affection to pumiced feet, known by the name of a "Seedy Toe," is thus described by Mr. Spooner, in his work on the foot of the horse:—"It can scarcely be called a disease, but it is rather a natural defect, which may be considerably increased by labour and bad shoeing. It arises from too great dryness of the horn, which renders it brittle, and causes its fibres to separate. There is a want of that tough elastic material which connects the longitudinal fibres together, and produces that strong bond of union between them and the horny laminæ of the sole. There is a hollow space within the foot, which sometimes extends upwards and around, so as

to admit a large probe. Neither the bone nor the laminæ, however, are exposed, but are still protected by the internal portion of the crust. The only thing to be done is to anoint the foot occasionally, particularly the affected part, with tar and grease. A blister may also be applied to excite the development of a new growth of horn, that which has become dry and brittle being occasionally cut away."

THRUSH.

Thrush is well known to be a disease of the frog of the foot, and is defined to be a rupture of the cleft of the frog, from which is discharged a highly offensive kind of fœtid or ichorous matter. In fact, this complaint consists of a diseased action of the sensitive frog; for, instead of secreting that elastic horny substance, composing the healthy frog, it secretes pus, which escapes between the cleft of the horny frog.

Some consider it as of trifling importance, but we have seen it of the greatest consequence, and would recommend great caution in the treatment of thrush, though almost every groom has a sovereign remedy for it; but he probably looks no further than the seat of the disease, not thinking that another affection of the foot is proceeding rapidly, as thrush will sometimes lay the foundation for contraction, by the excitement of the parts around.

The disease is frequently produced by moisture; more especially if it be of an acrid tendency, as that of dung, urine, &c.; but in this case, the hind feet are generally the parts most affected, from their being more in the dung and urine; and there is great danger of its producing grease and canker, if suffered to go on for a length of time. Contraction is a cause of thrush, by squeezing the heels together, until the rupture of the frog takes place. It is not, however, a general cause, as there are many contracted feet without thrush. The different actions of the secreting organs is here made plain; the inflammatory action going on in sensitive laminæ, increases the growth of horn, so that the frog never comes in contact with the ground: this, of course, promotes contraction, and the contraction ruptures the frog; and all for want of what? more *frog-pressure;* for as the frog is deprived of its natural *frog-pressure,* so do the heels contract, and so will the frog become decreased; consequently, diminishing the secretion of horny frog. A horse, with an open thrush, or what is termed a running thrush, cannot be considered safe; for a stone getting into the cleft of the frog, will invariably bring him down, from the great pain which the pressure of this foreign substance gives him.

It has been argued by some very clever men, that thrush is purely local; but we have seen many cases where it has been constitutional. For example, many horses which have had thrushes, have had them stopped, the parts all dried up, and clean feet brought to view. But, in a few weeks' time, examine their eyes, and it is ten to one but they will be found *either blind, or going blind.* We have used all kinds of depletive medicine; also tonics; but all to no purpose. Should there be fear of the horse losing his sight, it is better to put up with thrush, which can easily be again produced, by stopping the fore feet with hot horse-dung for a couple of nights.

Thrushes are generally stopped with little difficulty. Almost every astringent will stop the flowing of thrush. We have known them stopped with tincture of myrrh and tow; but in such cases we should not class thrush among the constitutional, but among the local diseases. Further, horses seldom or ever, with such thrush, go lame, unless it is allowed to go on, when the inflammation, in consequence, produces contraction. Tar alone is a very good remedy. The following is what we have generally used:—

Calamine, prepared	1 oz.
White Vitriol	1 drachm.
Tar	3 oz.

Mix well together; but before using, the frog should be well examined, and all the decayed parts, sinuses, or wherever the discharge has made its way, removed, so that the application may be thoroughly applied. This will, also, prevent a further harbour for dirt and moisture. The whole frog must now be smeared well over with the mixture; then a pledget of tow taken, well charged with it, and forced to the bottom of the cleft of the frog, and into every other fissure or opening that may be, omitting none. The back parts of the frog, where it joins the heels, are sometimes cracked.

These, also, should be anointed. To dress the feet neatly, great care should be taken that the tow does not hang out, as it may catch objects, and thereby be drawn out. To prevent this more effectually, take a good-sized piece of tow, and place it over the frog, fastening it with two thin pieces of wood, laid across each other. If the case is a bad one, renew the dressing every day; but should it not be so, every second day; always observing the stoppage of tow, to prevent dirt and moisture from getting in.

When a horse is affected with thrush, he should, in no case, be turned out; for the night-dews, besides other liabilities to come in contact with moisture, will inevitably undo all that has been done towards eradicating the disease. Hunters, that have what is called a summer's run at grass, rarely come up to stable, but some of them have got thrush, evidently from the moisture. The groom, probably, thinks this of little importance at the time; though coming into a warm stable, &c., with such an affection, soon proves that the foundation of contraction is laid.

A great many, on this account, assert that thrush is the cause of contraction. In the above case we would strongly recommend the bar-shoe, shouldered down from the quarters.

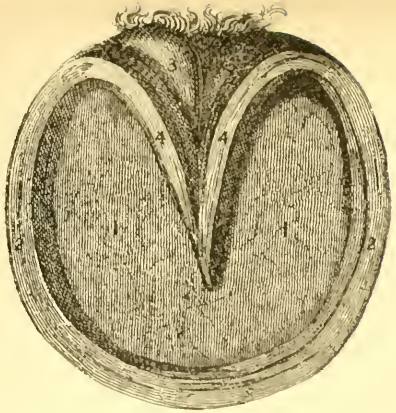
SANDCRACK.

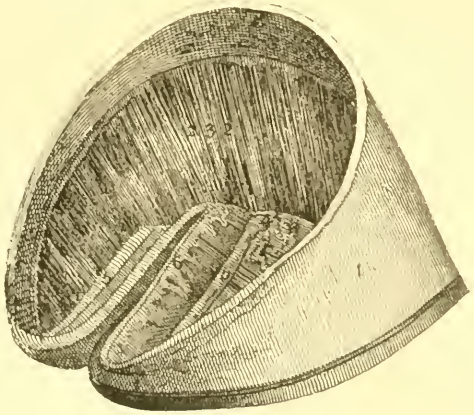
Sandcrack may be termed a division of the horny fibres of the hoof, in a direction from the coronet downwards. It is more common to the fore than the hind feet. When the hind feet are affected, it is chiefly amongst cart-horses, but not from the same cause as the fore feet of other horses. Cart-horses, with their immense high-heeled shoes, are apt, from the least irritability, to rub one foot, or the heel of one foot, against the front of the other, thereby causing a sore at the coronet, which splits the hoof downwards, and becomes what is termed sandcrack.

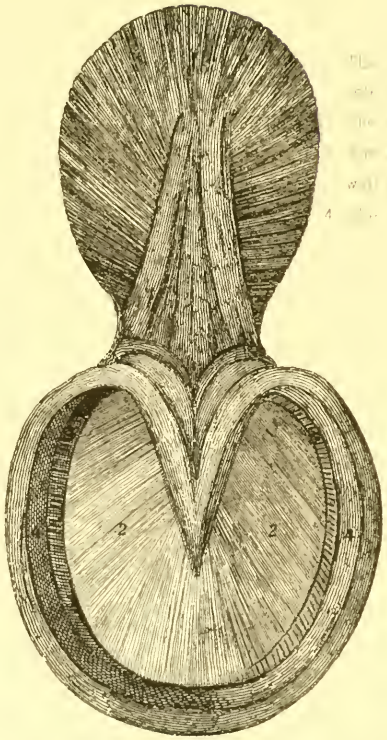
In the fore feet of horses, the disease frequently attacks the quarters, as well as the front of the hoof, especially if this is hard and dry naturally. It may also be brought on by injuries done to the coronet; such as those which arise from stubs, bruises, &c.

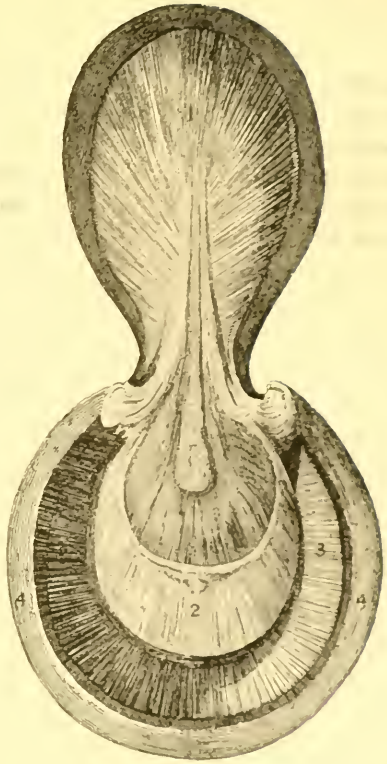
The fissure, or cleft, is not always of the same depth; and is sometimes of such a trifling nature as not even to penetrate the horn, where it causes very little inconvenience. This is the state in which sandcrack should be looked to —that is, in its early stage—when the curative process will be much milder, and the disease brought quicker to a termination. At other times it goes through the horn, but does not divide any of the sensitive parts underneath. However, neglect, and continued work, will commonly bring any case from the slightest to the most aggravated state. When the crack has completely penetrated the hoof, it becomes a most painful affection, and produces extreme lameness. This pain arises principally from the edges of the horn pressing upon the soft parts, whenever the foot is put to the ground.

In treating for sandcrack, different methods, according to the nature of the disease, must be adopted. In the first place, having examined the foot well, the sole should be partially pared out, and the heels lowered, and a shoe put on, laid off the quarters moderately, if the crack is in front. Your next attention must now be given to the cleft or fissure. Not the least particle of dirt should be suffered to remain in it; but should there appear fungus or proud flesh, the probe should be used to feel whether sinuses have been formed. If so, all horn that may cover them, must be removed with a fine drawing-knife, and laid completely bare, to prevent their going further. Touch the fungus then with lunar caustic, and fill the fissure up with tow, saturated in compound tincture of myrrh, first pouring the sinuses full, if there be any, and covering the whole with another piece of tow. This done, bind the whole on with a piece of well-tarred twine. Let this dressing be carefully applied for two or three days, when, if the fissure is going on well, take a firing-iron, and draw it across it, both at the top and bottom. This will prevent its extending either way. Draw your lines almost to the quick, but not through. After this, dress the foot again, binding well up, as before directed. On a second examination, if the parts do not suppurate, they will be found dry, and looking kindly. If this is the case, take a fine drawing-knife, and pare down the edges of the fissure, taking care not to draw blood; and observe if there appear any oozing at the edges. If so, apply a little of the solu-

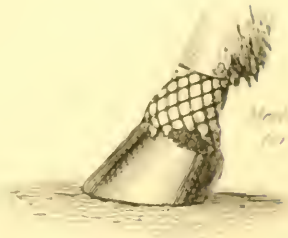








RING BONE



tion of nitrate of silver to the edges, with the point of a feather; then proceed to dress the wound with tar, fill the fissure full, and smear the foot all over with it. Have ready a pledget of tow, which place over all, as before. Put on a bar-shoe, and lay it off well at the fissure, so that there may be no bearing. Then take the brush, and apply tar all over the foot again. Repeat this dressing at least twice a week.

During the disease, the horse should have eight or ten alterative balls. (See *List of Medicines*).

PUNCTURED FOOT.

Punctured foot is a very common thing with horses, and is frequently attended with a great deal of pain; and in some cases it is followed by death. As the under part of the foot is so continually exposed to sharp bodies of every kind, whilst travelling, it need be no cause of wonder that the foot does occasionally strike upon something by which it receives a puncture. Sometimes, even the heel of the shoe may be too long; and if accidentally the animal should step on it, and partially pull it off, a nail will probably pierce the foot. The accidental puncture of a nail during shoeing, is also one of the most frequent causes of it. Injuries of this kind are proportioned in their effects to the parts injured. A puncture through the fleshy frog, even to the vascular portion, is not so productive of bad consequences, as probably may be a more superficial opening made through the centre of the sole, which may destroy the animal. Whenever a puncture is made of sufficient depth to penetrate the bony connections, and synovia escapes, the parts should be carefully examined with a probe; and if the suppuration has not commenced, apply compound tincture of myrrh on a small bit of lint. This treatment, in a few days, will heal the wound. Do not forget to place a large pledget of tow over all to keep out the wet and dirt.

If this treatment has been neglected, and suppuration has taken place, a bran poultice, moistened well with goulard water, should immediately be applied to the part affected, morning and night; and be renewed every day, until a healthy secretion takes place, when the wound should be dressed with compound tincture of myrrh. Should anything like spongy flesh make its appearance through, touch it lightly with diluted butter of antimony, and put the dressing over the part. These simple modes of dressing will be found to have a much more beneficial effect than most of those violent caustics, so much in common use.

Sometimes deep posterior punctures may penetrate as far as the tendon itself, and produce great pain and inflammation. In such cases, if the accident be early discovered, introduce a little tow, saturated with tincture of myrrh. If the inflammation be great, bleed from the plate-vein, and give alterative medicine (see *Medicine*) every second day. Should this not reduce the inflammation so quickly as desired, apply a bran poultice, as before directed.

The most common cases of puncture are those which arise from a wrong direction of a nail, during the operation of shoeing, in which it either presses on, or actually wounds the sensitive laminæ. This is frequently known to the workman; but, through laziness, he will not draw it out again, or a great deal of injury might be prevented. Were the nail immediately taken out, and a little tincture of myrrh poured down the hole, the smith might introduce a much smaller nail, and all things would go on well.

If suppuration, however, should arise, the shoe must be taken off, and the horn that may have been covering the confined part must be neatly cut away, to its farthest extent, detaching a portion of the fleshy part from the horny sole. Should it proceed upwards, and break out at the coronet, it sometimes takes a long time to heal; but recourse must be had to every means to prevent such an unhappy circumstance. However, after having pared out the sole as directed, next take the probe, and ascertain if any other sinuses are formed. If not, proceed at once to poultice with linseed meal, into which a large piece of digestive ointment should be well worked. (See *Medicines*).

Repeat this every day until the wound begins to look healthy. When such is the case, apply tincture of myrrh (first having placed on the shoe), and a large pledget of tow over all, fastened in with two pieces of stick, crossed, as instructed in other applications for the feet. Five or six days may

elapse before the discovery of the disease. If so, have the shoe taken off, and let the smith tap round the foot with his hammer. If the horse does not flinch, let him try with his pincers, by which he will easily discover the seat of lameness, when he should act as directed above.

OVER-REACHING.

Wounds about the coronet are very common, from one foot being set on the other. Hence it is called *over-reaching*, and generally occurs from a blow of the hind foot against the fore foot, wounding the edge of the coronet, or that part between the hair and hoof. We have known the hind foot strike as high up as the *fetlock*, and make a complete sore; but such is to be considered only as a simple wound, or rather as a laceration, or bruise. In no case let the old farriers dress the sore, as they invariably apply caustic remedies, which will make the matter much worse than before. First, wash away every particle of dirt that may be in the sore, or around it, with warm water and sponge; then take a pledget of tow, and saturate it in compound tincture of myrrh, and bind on with a linen bandage. Repeat this morning and night until the wound is healed.

As we have here given a remedy for over-reaching, a preventive cannot be out of place. Over-reaching generally occurs in horses having thick, upright shoulders, which partially deprive them of the action of the fore leg, as they cannot throw it out in the bold manner in which horses whose shoulders are placed more obliquely, do. The consequence of this is, that the hind legs, having more freedom of action, reach the fore legs before they are able to get out of the way, which is the cause of what is called over-reaching.

To prevent this disagreeable affection, the horse should be shod high before, which will assist him in getting his fore legs on; and without calkins behind, which will render their action slower, and thereby make all four legs work in unison.

QUITTOR.

Quittor is one of the most troublesome wounds of the foot the veterinarian has to contend with. It must have existed some time when a peculiarly unhealthy state exhibits itself, the ulcerated surface producing a diseased secretion, which may spread considerably around, and, in consequence, affect other parts. The tracts, called sinuses, are not difficult to ascertain, when we see the foot depending; and we all know that matter is sure to find a deepened orifice, if possible; but, when covered with horn, how is that to be obtained? Simply by the spreading of the matter itself amongst sensitive parts, which, in their turn, become diseased. Now the principal care should be to lessen all this, or, in other words, to remove the irritation then existing. But if the injury should extend to the ligamentous and cartilaginous parts, their living powers being small, a very different complaint is formed, and sometimes a very tedious and troublesome one springs up, from the difficulty of forming granulations in parts with such small living powers.

Quittor may arise from pricks in shoeing, punctures, and over-reaching; but with draught-horses, the most common cause is from wounds, or bruises, inflicted by a tread on the coronet. We never saw this disease in the front of the foot. It principally occurs at the quarters, in the neighbourhood of the lateral cartilages; although we have heard some say that the whole margin of the coronet is liable.

The great difficulty of treating quittor, from its being so unpleasant a disease to contend with, brought into use, by the older farriers, some of the most violent means of cure. These they adopted from their ignorance of its nature: the burning out with a red-hot iron was one of their favourite plans; but, happily, this is nearly abolished.

A quittor, when it had entered on the process of ulceration, and had dead portions of matter thrown off by suppuration, the farrier would say a *core* is come out. The wound should then be treated as a simple wound, or abscess; for farriers are too apt, on these occasions, under the idea of assisting the *coring out*, to introduce strong stimulants. Reduce the inflammation as much as possible, and thin the surrounding horn; and if the matter appears to penetrate in a direct line, downwards only, make an opening in the hoof below; but, in other cases, merely dress in any mild way, either with a weak solution of

sulphate of zinc, or compound tincture of myrrh. Put the horse on bran mashes, and give alteratives. (See *Medicines*).

When the complaint has assumed the appearance of confirmed quittor, and no longer retains the character of a simple bruise, wound, or abscess, it must then be considered as an ulcer, composed of different branches or sinuses, or, as the old farriers term them, *pipes*. Here the *coring-out* system has been abundantly used. On some occasions of bad quittor, a portion of ossified cartilage has come away; and this is by no means an uncommon occurrence.

In treating for quittor, the first thing to be done, is to examine well with a probe the extent of the ulcer, with the number and direction of the pipes. Should one of the pipes run inward, and come in contact with a firm, hard body, it is more than probable the bone is bare. Portions of the coffin-bone have been known to slough off; but we never knew a horse recover when that has been the case. If the capsular ligament becomes ulcerated, and the joints exposed, such a case is a hopeless one, when the pipes run at the back of the cartilages; but when these take an inward direction, they produce a hopeless case. If the direction of the sinuses, however, is outward and downward, or backward towards the heels, the cure then may not prove difficult. The next object is to stimulate the parts to a healthy action, which may be done by introducing any of the following:—Verdigris, or corrosive sublimate (finely powdered), butter of antimony, arsenic, solutions of potash, and lunar caustic. These are all excellent remedies for the disease. Prudence and humanity dictate that the mildest should be tried first. Therefore try zinc, powdered fine, and fill the orifice full, nearly up to the skin, and gently pressing it to the bottom of the wound; then lay a bit of tow over the sore, and bind on with a bit of broad tape. Keep the horse as quiet as possible; and he must not be allowed to go out to grass or to work. If the milder treatment fails, a liquid stimulant, with which you will be able to reach all the sinuses, must be used. Tincture of cantharides, with turpentine, or a mild solution of caustic alkali, or the lunar caustic, introducing small pledgets of tow with whichever of these may be selected, or which may appear the best for combating the disease. Should these also fail in producing the desired object, more active stimulants must be resorted to. Therefore mix about an ounce of tar with finely powdered corrosive sublimate; then take small pieces of tow, and impregnate well with the mixture; next place one of the pledgets thus impregnated at the end of the probe, and lightly press it to the bottom of the sinus. Do the same until every one is charged; then fill up to the top of the orifice with the mixtures. Caution must be used when introducing the pledgets, so that no force may be felt in the operation. If the quittor should be what the farriers call *foul*, mix a drachm of verdigris with the above. It would be well to thin the horn a little round the parts, as it will have a tendency to remove the pain that naturally arises. Let the dressing remain on for two or three days, until sloughing takes place. If the parts look red and clean, it may be expected that, by simple dressings of tincture of myrrh, the wound will heal, from its healthy appearance.

If, unfortunately, this should not be the case, proceed again in the same manner as before, until a healthy appearance is made. During the application of these remedies, alterative medicines, every second day, must not be neglected to be given. (See *Medicines*).

CANKER.

Canker is one of the most obstinate and destructive diseases to which the horse is subject. It consists in the separation of the horn of the insensitive from the sensitive sole, caused by suppuration having taken place between the two, and may be variously produced. It may spring from neglected thrush, in which the sensitive sole participates in the inflammation of the sensitive frog. Neglected grease will sometimes occasion it. In both cases it is frequently engendered amongst cart-horses, particularly where they are crowded together, for there is more grease and thrush in large cart-horse establishments than in any other; and if care is not taken in time, canker soon shows itself. It often arises from pricks; and when such is the case, the flexor-tendon becomes injured—in all probability *locked-jaw* may supervene. Treads, bruises,

or bad corns may now and then occasion it. It seldom occurs in the fore feet, clearly showing that dung and urine are among the gene- causes.

Canker is a formation of fungus, or proud flesh, produced by an unhealthy secretion, and has the appearance of a cauliflower. In treating for it, the first thing to be done is to reduce this to a level with the parts that appear healthy. This will be effected with a sharp scalpel; and although considerable bleeding will take place, it need give no alarm. Have a bottle of butter of antimony ready (see *Medicines*), and, with a feather, touch every part of proud flesh, and between the parts. Next proceed carefully, with a probe, to examine what extent of the sensitive is separated from the horny sole; and exactly to the extent of separation must the sole be nicely pared away, with a very fine and sharp drawing-knife; for the horny sole, once separated, never re-unites, but becomes a foreign body, and, as such, injurious. Every portion of separated horn should be carefully removed; and this must be attended to at every future dressing. Again examine, with the probe, if the disease has proceeded in any other direction. If so, it must be treated as above, by a careful removal of all detached parts; let these be cut away, neatly and evenly, and no rough edges suffered to remain.

By using the above means the fungus may be removed; but so long as any of this fungus continues sprouting or growing, so long the cankered action is going on. Before proceeding further, that must be completely done away with; for while it is there, no secretion of firm horn will take place. If a secretion of thin horn, which will sometimes occur over many portions of the surface, is perceived, it must be carefully removed at each dressing, until the application of caustic stimulants and pressure produce a healthy surface, and a proper quantity of pus only, which will finally end in good horn. After the whole of the sole has been brought to secrete good matter, sprinkle it with the following :—

Sul. Zinc, finely powdered . . .	½ oz.
Verdigris	1 do.

Or,

Blue Vitriol	1 oz.
Alum	1 do.

Sprinkle either of these all over the sole, so as lightly to cover it; then lay a pledget of the finest and cleanest tow on the whole; fill the cavity with other tow thickly over the bottom of the foot, fastened in with strips of wood, as before directed, crossing each other. This will keep up a firm and equal pressure. After this, take a piece of coarse cloth or sacking, and wrap the whole well up in it. This will keep the foot dry, as nothing tends to increase the growth of proud flesh so much as moisture.

There is a great fault in not dressing cankered feet sufficiently often. They ought, at least once a day, to be dressed; and if the case is bad, they ought to be examined morning and evening. Trouble, in this disease, must not be considered; for if the foot becomes neglected, the parts are much longer in healing, and, when healed, are not nearly so firm as if well attended to. Horses affected with this disease should never be turned out. In order to avoid moisture, the mild caustic mode of treatment, with the pledget of tow nicely fitted into the foot, will be found to equal any dressing, when applied with care. Alterative medicines should be given every second day. (See *Medicines*).

FALSE QUARTER.

False quarter generally arises from one or the other of the preceding diseases; in both of which, from the injury done to the coronary vascular ligament, at one particular part, it can never afterwards secrete horn in a perfect line; but the interruption which first originated between the old and the new horn, continues to be propagated. Consequently, it is called false quarter; and it, of course, very much weakens the foot. Sandcrack is sometimes produced by it. The only remedy is, to continually blister the coronet at the quarter; and to shoe with a bar-shoe, well laid off at the seat of disease. The hoof may be dressed with tar, or the foot-ointment (see *Medicines*), and kept as free from dirt as possible.

CHAPTER XXXV.

SHOEING

SHOEING, like all other things connected with the horse, has received considerable improvements within the last half century. Indeed, the great improvement made in this department of art, since the establishment of the Royal Veterinary College, precludes the necessity almost of offering an opinion at all on the subject; and the able works of Professor Coleman, Mr. Bracy Clark, and Mr. Goodwin, set forth all that is necessary on the subject. A few observations here, however, seem to be demanded from us. The anatomy of the foot of the horse is now clearly understood, and without such knowledge no man can shoe one properly; and the benefit derived from this knowledge cannot but rejoice those who recollect the numbers of valuable animals that were formerly crippled and rendered useless by ignorance of shoeing. The post-horses, stagers, and hackney coach-horses, were composed principally of crippled horses, or such as were termed groggy in the feet. These poor animals would stand with their feet forward, or, as it is called, *pointing*, in the greatest anguish, shifting from foot to foot alternately, to gain a little ease, their very countenances expressive of extreme pain; but now, comparatively, few so affected are to be seen. With care, the foot may be preserved to the last. Formerly, a young horse, fresh from the breeder, would, in the space of two years, have his feet gradually become unfit and unsafe for any gentleman's riding, and in his very prime he would be cast off to hard labour, rendered more intolerable by increasing pain.

Though the improved system has now become almost so general, that every person employed in shoeing horses knows how it ought to be done; nevertheless, there should be, in practising it, a degree of care which some men will not observe; but will pursue their own way, and fancy they know better than all the veterinary surgeons in the world; and, in spite of every endeavour to teach them, they will do as they like at last. It may be necessary to apprise the man who forges the shoe, whether the horse is apt to interfere, which is called cutting; or whether he over-reaches with his hind foot, striking against his fore shoe; which is extremely unpleasant. These things may be prevented to a great extent, or, indeed, totally, by making a proper shoe, and placing it accordingly. The interfering is remedied by leaving the inner heel as high as possible, and paring the outer heel in moderation, whilst the inner heel of the shoe is made thicker than the outer. This raising of the inner heel throws the fetlock joints outwards, or wider apart; which, with that part of the toe that is liable to interfere, pared close, and the shoe nowise projecting, will prevent the interference, or what is called cutting.

The hind shoe striking against the fore, is prevented by shortening the heel of the hind shoes, so that the hind foot moves in unison with the fore foot; for this striking arises, principally, with heavy forehanded horses, that cannot get their fore feet so quickly out of the way of the hind; and produces that unpleasant noise which arises from their striking, and which, at times, is almost beyond bearing.

When horses, newly shod or removed, go unsteadily or unsafe, which before went safe and well, it is reasonable to suppose that the shoes have not been put on properly. We have seen horses, on being removed from the farrier's shop, go as if crippled at every step, and, to all appearance, as if it were with the greatest difficulty they could keep themselves from falling down. The shoes may seem to be put on right enough, and the nails may appear to be properly driven in, so as not to touch the sensitive part of the foot; but the evil arises from the shoe not having an equal bearing; that is to say, not equal at the heels and at the toe: but we have no objection to the shoe bearing on the outer heel, *but it should not, by any means, bear on the heel and quarters inside;* for if this be the case,

corn, contraction of the hoof, thrush, &c., will be produced. Although we do not approve of the shoe being so hot when it is applied, as to sear the foot, yet its application should be made when it is moderately hot, to show where the shoe bears, and where it does not, that the rasp may take down some places till the bearing becomes equal. This is a less evil than putting the shoe on at hazard, where there is not equal bearing on the outer side and toe. The driving of the clenches down too much, may cause pain and uneasiness; but it is not so likely to pinch when the shoe sits solidly, as when it does not. For this reason, in shoeing, advise but *two nails to be driven* in the inside, and *those two next the toe*. By this the shoe is neither drawn nor warped; for, you must recollect, the shoe not being elastic, and it being nailed to an elastic body, something must give way; and the elastic body will, sooner than the non-elastic: and, further, this occasions the shoe frequently to break; and, what is most singular, the breakage almost always takes place at the quarters where the most elasticity exists; proving that there is not so much fault in the iron, as in the confinement by the shoe of the elastic part of the hoof.

When extreme lameness, and consequent uneasiness happen immediately after shoeing, the shoes should be instantly taken off, to ascertain how they were fitted on; though it frequently occurs, that drawing out the two back nails of the inner quarter will at once give relief. Not that we are to expect horses with bad feet to go so pleasantly in new shoes as old ones. Those with thin flat feet cannot be supposed to go so well as those with strong feet; consequently a different shoe is required. A shoe to, suit soft thin feet, ought to be well chambered out, as it is called, with a broad web, and only bearing on the edge of the crust: but horses having such feet should have the bar-shoe; and until it is, in some measure, settled to the foot, the horse will go tender and unpleasantly.

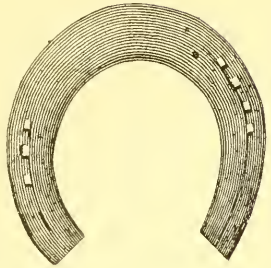
The substance and weight should be proportioned to the work or employment of the horse. Never load the foot with more iron than is necessary to preserve it. If the foot is light, let the shoe be light also; and if the horse works principally on the road, his shoes should be somewhat stouter. In thus proportioning the weight of the iron to the strength or weight of the hoof, a large part of the art of properly shoeing horses is involved.

CHAPTER XXXVI.

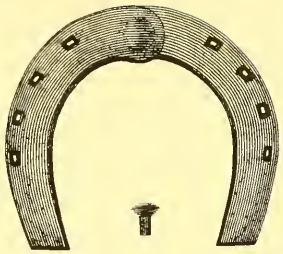
OPERATIONS AND RESTRAINTS.—BRONCHOTOMY; ŒSOPHAGOTOMY; NEUROTOMY; DOCKING; NICKING; CROPPING; BLEECHING; PURGING; FIRING; BLISTERING.

When it is necessary to perform any painful or unpleasant operation on the horse, from his strength and power of resistance, it is necessary, for our own security, as well as for the safety of the animal, to restrain him in such a way as to prevent any danger that might otherwise arise from his struggles. Horses, like men, differ much in temper; and some of them, when undergoing any operation, bear pain very differently to others: but it is always wise to be guarded against the worst; and very few important operations should be attempted without casting. Great care should be taken to be as humane as possible, and prevent as much pain as lies in our power; though, at times, means are obliged to be resorted to.

There are other restraints besides the *hobble*, such as the *twitch*. This latter instrument is most frequently used by all classes of horsemen; for there is hardly an operation performed that does not require the twitch, which no stable should be without. Still, if used with violence, it is apt to make an animal more uneasy and restive than otherwise; conse-

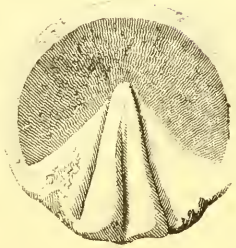


The Shoe for a sound Foot

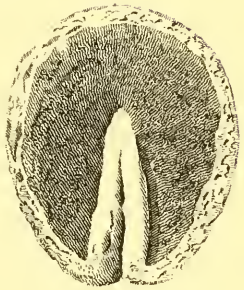


Hinge or Pivot Shoe

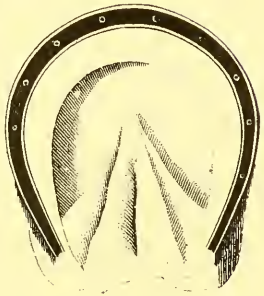
A Frost Shoe



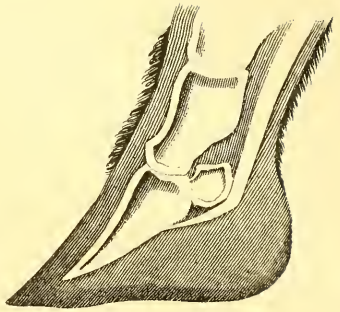
Perfect Foot



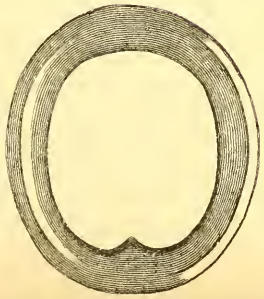
Contracted Foot



Clip or Patent Shoe

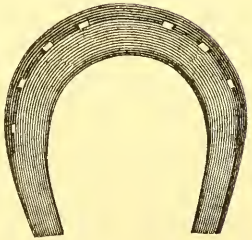


Section of the Foot



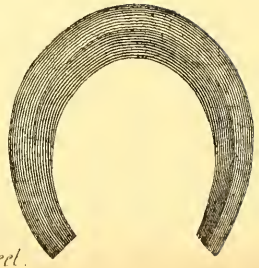
The bar Shoe for tender Frogs.

The female screw in the heel.



The Hunting-horse Shoe.

The sharp wedge screwed into the heel.



The concave Shoe for flat Soles.

quently, great care is required in using it. To make a twitch, the staff should be about thirty-six or thirty-eight inches long, with a small ring-bolt driven firm into one end; then a piece of sash-line should be put through the eye of the bolt, and the ends tied together, about six inches from the end of the bolt. This completes the twitch.

Most persons, and especially the inexperienced, guard only against the hind feet; but they will find that a blow from a horse's fore foot, if properly directed, will come with terrible force. In all operations, therefore, it is best to blindfold the animal, as by so doing he becomes greatly intimidated; nor will he often strike without being much irritated.

Another kind of instrument, principally used by smiths, is what are termed *barnacles*, which is a kind of clam, with a gauging-ring to regulate its tightness, and is sometimes applied to the horse's ear at the time of shoeing. It is, we believe, at times used for the nose; but not unless the animal is first blindfolded. Sometimes all can be done that may be wanted, by an assistant holding up the opposite leg. With regard to holding up the hind leg, one hand should always have a fast hold of the point of the hock. The horse cannot move then without giving warning; and should he feel inclined to kick, you will be enabled to get from him without danger. It is highly necessary that these precautions should be attended to, for two reasons; the one, to prevent any accidents that the operator may be liable to; and the other, that he may not be suspected, by those around him, of not knowing his business.

There is another restraint, called the *side-line;* and though very simple in its nature, of great use, and now in very general application. Many veterinarians use only the side-line, considering it to be quite sufficient both for the safety of the man and the horse; but, if the animal makes a sudden plunge, it is ten to one that he comes down altogether. It consists of a hobble-strap, and about six or seven yards of rope, nearly the thickness of a man's thumb, and is termed a neck-collar. To make use of the side-line properly, a roller, made on purpose, should be used. It should have several rings on the pad part, both on the sides and top, to answer convenience. All things being ready, put on this, and then slip the neck-collar on, down to the horse's shoulder, and strap the neck-collar to a ring of the roller. By this means, if the horse should by chance hold down his head, the side-line will not get shifted (which it would do, if fastened round the neck alone). Now buckle the side-line on to the fetlock, on the side on which you are to stand; pass the line or rope through the horse's legs, and through the neck-collar, taking it back, after giving it one turn round the collar, to the fetlock. Do the same there; then bring it back again to the collar, where make fast. After this confinement, anything may be done with the horse on the side on which the line is.

Hobbles are used when a horse is to be cast; and then one hobble-leather is placed on each fetlock, each leather having what is termed a D ring attached to it; one ring and leather being fastened to a long rope, very supple, but strong, and about an inch and a quarter in diameter. In putting on the hobble, observe which side you want to cast on. If it be on the off-side, place the rope-hobble on the near fore fetlock, then buckle the three others on, and, taking the end of the rope, hand it to an assistant to thread the off-fore-foot D ring. Let him pass the rope to the off-hind hobble-ring, when you will receive it, and pass it through the ring of the hind hobble of your side. After this, carry the rope up to the near fore foot again, and put it through the ring there; which ring must be considerably larger than any other, because there is double the quantity of rope in it. All this time the horse should be blindfolded. Having your proper strength ready, desire them to pull steady, and together; then you will place your hand against the horse's ribs, at the same time pushing him, when he goes down easily. There is a plan used at the Royal Veterinary College, of one person having a piece of webbing fastened to the roller, who stands at the opposite side, and gives a smart pull, just as the horse is off his legs, which quickly brings him over. By following the above directions, the horse may be said to be rather let down than cast or thrown.

The moment the horse is thrown, the rope must be fastened with what is termed a half-hitch, in which a small pad of straw is inserted, and by which means the rope is drawn much

tighter. The person at the head must keep that secure; for all the efforts to disengage himself are first begun by endeavouring to get his head at liberty, so that he may raise his fore parts. Plenty of straw should be placed underneath his head, so that he may lie as easy as possible. Care also must be taken that the horse breathe freely when down, and that no more time be wasted in the operation than is absolutely necessary, as many animals struggle the whole of the time, and exhaust themselves very much.

BRONCHOTOMY.

Bronchotomy is an operation performed on the bronchia, or wind-pipe, in bad cases of strangles, or when tumours exist in the throat, which threaten the animal with suffocation; or if an apple, potato, or a piece of carrot has slipped into the œsophagus, &c.

The operation of tracheotomy is not of a difficult nature, and consists in making a longitudinal section through two or three of the rings, occupying about an inch square, that may be taken away from the front of the cartilaginous substance. A flexible tube should then be introduced into the opening, and retained there as long as possible.—This operation has been performed in cases of roaring; those who performed it thinking the obstruction much lower down than it is.

ŒSOPHAGOTOMY.

The œsophagus may be readily divided, in cases of strangulation, from the obstruction of too large a ball, an apple, or from the accumulation of dry bran and chaff, which sometimes takes place in greedy horses.

NEUROTOMY.

Neurotomy, or the nerve operation, spoken of some time back, now comes under our notice. We have stated that this operation was performed for diseases of the feet, principally of such as are dependent on a contracted form, or otherwise altered in the form of the hoofs, excepting the pumiced hoof. The nerves having been long known as the medium of sensation, many cases of lameness in the feet occur, which render horses useless, principally from the pain and tenderness consequent on the pressure of some parts of the foot, long since altered by disease; but which are not now actively engaged in a disorganising process.

Where there is reason to expect considerable disorganisation of the internal parts of the feet, such as ossification, or total absorption of the articular cartilages, or diseased alteration of the bones within; the horny box, or where inflammation of the laminæ may have wholly destroyed their sensibility, or where the mucous capsules have, from disease, ceased to yield any, or but a partial supply of synovia—in all such cases the operation cannot be expected to restore the mobility of anchylosed parts, nor can it restore the lost organisation; but, even in such cases, when morbid processes are not actually going on, but seem stationary, and the animal is rather suffering under the effects of former than of present disease, this operation has, by rendering the animal less susceptible to the pain of pressure, enabled him to move and exert himself with more ease to himself, and benefit to his owner. When violent inflammation is in the foot, however, that must be removed, or tried to be removed, before the operation is attempted to be performed.

Sometimes it has happened, in such cases, by removing sensation and rendering the animal willing to exert himself more than the state of the parts will allow, that great aggravation of the disease has frequently followed. We believe it has never been found to answer in the disease called pumiced foot; the operation there being particularly hurtful. Neither should we recommend it in any disease of the foot, until we had tried every other means without accomplishing some good Should success not attend other applications, we should not then hesitate in immediately performing this operation. In others, according to circumstances, with the exception before insisted on. Neurotomy has been found to render many horses with contracted feet, and other wise foot-lamed, not only useful, but has rendered them nearly as perfect, in their mode of going, as ever. Some have hunted, many have made excellent roadsters, and all have been fitted for carriage work of every description.

The importance of this operation, though great in veterinary practice, is in some measure removed, when attended with misfortune afterwards. This may arise from the inflam-

mation not being properly subdued at the time of performing the operation; so that the disease still went on, with all its consequences. However, we prefer the higher to the lower operation, as we have seen less ill consequences arise from it. Some veterinarians prefer the lower one. For ring-bone, the lower one should never be practised. One reason for giving preference to the upper operation to the lower is, that after the operation, the end of the nerve frequently draws itself up, and forms a bulbous end. This coming in contact with the joint, the horse goes as lame as ever in the course of a few days. What is the consequence? Why, the high operation is obliged to be performed, and the horse is immediately upright. If a similar formation manifests a disposition to attach itself to the higher part of the nerve, in this mode of operating, it becomes protected by the tendon, and nothing further is heard of it; for, where no lameness returns, there is reason to suppose that the disease is overcome.

Whilst practising in Devonshire, a very large proprietor of horses, and a mail-contractor, had the misfortune to lose an animal, by both hoofs coming off, and which was not discovered until after he had arrived in the hotel-yard. He evinced not the least lameness during his journey, and was driven by one of the most humane men who ever sat upon a box. Another instance occurred to the same gentleman, and by the same coach. On taking the horses off, one of the leaders appeared to go stiff before; and thinking it was a slight inflammatory action of the foot, his feet and legs were bathed in hot water. On the morrow, however, he could not move his fore feet in the stall, and, of course, a more minute examination was required. This enabled us to detect the bones grating together at the large and small pasterns. The horse was immediately destroyed, and both large and small pasterns were fractured in an oblique direction:—one of the specimens the owner presented us with.

Description of the Plate of Nerve Operation.—This plate shows the two methods that have been commonly employed in performing the operation of neurotomy. It is of the greatest importance to observe that the nerve should be divided with a very sharp knife. The neurotomy knife is the best to use, and should be always kept in good order. Some operators use curved bistorys and scissors, which are superfluous. When the division is made with scissors, that part of the nerve may become numbed, and then it is that the bulbous lump forms, much to the disadvantage of the horse, as well as to the success of the operation.

Description of the Figure.—A represents the horse's leg taken off a few inches below the knee, and also the foot removed. B the situation for the high operation. C the nerve running behind the artery. D the artery. E a blunt-ended needle, armed with whitey-brown thread, to take up the nerve with. The reason of its being blunt is, to prevent it from injuring the artery. F the two tenaculum, employed to show the parts. The one on the left hand represents the operator's finger drawing back the skin; the one on the right shows the finger of an assistant, whilst the operator inserts the armed needle under the nerve. G the situation of the low operation.

We remarked that preference was given to the high operation, performed even a little higher than the locality marked in the plate. For, when performed in this part, the nervous communication with the foot is more completely cut off, and the cicatrix is quite out of the way of being struck with the other foot.

In this part, the nerve lies rather deeper, especially on the inside of the leg, than it does nearer the fetlock-joint; but there is no difficulty in finding it, if a little cellular membrane is carefully removed. Three-quarters of an inch of the nerve is quite enough to be cut away, and the incision of the skin need not exceed one inch. After the nerve has been cut out, the wound should be closed by one stitch, and a linen bandage should be applied, moistened with cold water, and allowed to remain on for a day or two, when it may be removed, and the wound dressed with compound tincture of myrrh, and tow dipped therein. Apply the bandage again.

Mode of Performing the Operation.—The first thing to be done is to cast the horse in the most convenient and easy place that can be selected. Allow the leg intended to be operated upon to be taken out of the hobbles, and fasten a piece of webbing round the pastern, to be held firm by an assistant; the

leg should be suffered to rest on a bundle of hay, or straw, to raise it up for the convenience of the operator. All things being thus arranged, the hair must be clipped close off the part intended to be operated upon, whether it be for the high or the low operation. Then sponge with water; and when the instrument has been used, have ready the sponge in case of profuse bleeding, which is sometimes the case, and is apt to cause confusion, unless the blood be immediately taken up. The pulsation of the artery will now be readily recognised. Then cut down a little posterior to such pulsation, but still keeping the finger on the artery. When a section has been made of about an inch, completely through the skin, lay the knife down, and open the orifice with the thumb and finger, and have it sponged, when the nerve will be seen running immediately behind the artery, perfectly white. Next introduce the blunt-ended needle, under the nerve, and draw it through as far as convenient. After finely dissecting the cellular membrane from the nerve, it may be divided as high up as the section will admit. This will occasion a violent struggle in the horse; but dissect as far down as may be thought proper, and excise what quantity of nerve you like, and he will make no resistance whatever. The skin should be now drawn neatly together, and a stitch or two placed in it; then dress as before described. On removing the bandage, after the first day or two, dress with compound tincture of myrrh. Small pledgets of tow, dipped in this mixture, and applied every day, will soon make the parts heal.

It may clearly be seen, that the motive for using the nerve operation, is to relieve pain. Stallions, with pumiced feet, suffer greatly from pain; and we may be sure, where such is the case, it unfits them from getting healthy progeny. After the nerve operation many of them have proved healthy and vigorous. Mares also, which, from the same causes, have ceased to feel the periodical œstrum, or inclination for the horse, after the operation have resumed their fecundity. The operation is, therefore, not only beneficial in removing lameness, but also bodily pain arising from other sources; which makes it very necessary to be understood.

DOCKING.

Docking is an operation performed almost on all horses, excepting the racer and the cart-horse; both of which are allowed to enjoy nature's gifts without any curtailing. Still, we cannot but say, that from the improvement which docking makes in our hackney horses, it is not likely that it will fall into disuse. The excessive docking, however, that some horses undergo, does not add to their beauty; although some argue that a short dock strengthens a horse. For ourselves, we are no advocate for the short dock; neither do we approve of docking colts almost as soon as dropped, as being at all beneficial to the future growth of the animal. Early docked colts will have less hair on them than at a more matured age; and as the irritation occasioned by docking in these young animals, makes them apt to rub their tails against anything they come near, it is the cause of making the hair either very rough, or rubbing it off altogether. The length of the dock must be left to choice; about nine inches is the general length now-a-days. When the length has been determined on, the long hair should be fastened back from that part, while, about an inch or two below, it should be shorn clear away. Apply the docking-machine to this part, first finding a joint, and the dock is removed at one stroke. Various means have been adopted to stop the bleeding; but none is equal to the actual cautery, which, if mildly applied, answers every purpose without further trouble. Simple as this operation may appear, the old farriers were wont to make a dreadful fuss over it; and what with burning the horse's tail half off, and resining it besides, it became a matter of wonder that the animal escaped locked-jaw, which frequently supervenes on docking, and the violence used afterwards.

The bleeding scarcely ever proves fatal, and seldom injurious, therefore there is little necessity for cauterising; but if the bleeding should continue, the thing to be done is, to take a handful of flour, and, applying it to the end of the dock, draw all the long hair down over it, and tie as close to the dock as possible. This will soon plug up the ends of the arteries, and stop the bleeding.

Many persons are very fond of elevating the tail, with an idea that the horse will carry one that is much superior, if done so. But this is not the case. If lock-jaw should make its appearance, immediately operate anew, without restraining the blood at all, as its loss will be both useful and necessary in such a case. Administer large doses of opium, or, if the mouth should be so much closed, laudanum in gruel must be given frequently; say, an ounce at a time; of the opium, four drachms.

If it should put on a gangrenous appearance, apply oil of turpentine to the part several times a day. Hot applications between applying the turpentine will also be of great service.

NICKING.

The practice of *nicking* is now almost out of date. There is little doubt it originated from the circumstance of large fine horses carrying their tails "*tucked in*," as it is termed, but which tended to reduce their value, except when they happened to be under excitement, then they would carry their tails erect enough.

With nicking, as with castration, a favourable time of the year should be selected for it; and we should recommend the spring, when the weather is not too hot or too cold; for, in cold weather, the granulating process may become stopped; and, in very hot weather, lock-jaw may supervene. The modes of securing the horse for the operation are various. The break, or trevis, was a favourite mode of the old practitioners, but it is now entirely done away with. A strong rail, or leaping-bar, across a stall, was another means; but these were used only by grooms and dealers. Most veterinarians are in the habit of casting the horse for this operation, and we ourselves have always done so; for the more secure and safe the horse can be made, the less time is taken up in the operation, though dealers are sometimes very expert at performing this operation standing. The more secure way, however, is preferable.

The horse being properly secured, have the twitch ready to place on the nose. Have also two bundles of straw or hay, and raise the horse's feet, so that he may lie on his back; prop him up in this position with the hay or straw, by placing a bundle on each side of him. We should have mentioned that, previous to casting the animal, the hair of the tail ought to have been plaited, and the end neatly turned back, and bound firm with wax-end. When all this has been done, take the nicking-knife, which is double-edged, and which makes it more convenient, and prevents the trouble of turning. The mode of making the sections must be left to the discretion of the operator. They should, however, always be made in the middle of a tail-bone, not at a joint, which will easily be discovered by the prominences rising at either end of the bone. This should be carefully attended to, otherwise the most serious consequences may arise.

It is the practice with some veterinary surgeons to make a section through the integuments only, beginning at the roots of the hair on one side, and carrying it across the bellies of the muscles; then doing the same on the other side; and, lastly, making these sections meet by a light and careful division of the integuments only, on the median lines of the tail. Such is not only a very cautious, but a proper mode for young practitioners, and is also consistent with good practice; but it is apt to take up more time than older and more experienced veterinarians are willing to give it.

The first section should not be nearer, in the smallest horse, than two inches and a-half; and in full-sized animals, three, or three inches and a-half, as the centre of the tail-bones may indicate. In mares, one section *less* than that in a horse is admissible. The most expert operator will, however, find it prudent, when the sections are made, to examine them carefully, that they are all equal in depth, and that the depressor-muscles have been completely divided.

Should any difference appear in these respects, and should such unequal division be allowed to remain, the operation will be incomplete, and the horse would, in all probability, carry his tail awry. Added to which, any portion of the muscle being left undivided, would tend to prevent the others from retracting, and might also serve to promote a reunion of them. Being satisfied that the sections are all complete, the bleeding that ensues need not be considered of consequence, nor will it show itself until the tail is relaxed. The ends of the tendons must now be looked to, and,

with a sharp and strong pair of scissors, the projecting ends thereof nipped off; enough will always protrude to be taken hold of with the forceps.

The removal of these ends will not only separate the attachments of the muscles further from each other, which, if reunited, would of course frustrate the operation; but their removal will greatly facilitate the healing of the wounds.

The section being thus completed, the hæmorrhage must be restrained, which is done in various ways. Some do this by means of strips of cotton, tow, hemp, &c., which is twisted, and inserted into each nick, and separately tied on the back of the tail. As good practice as any is to take a piece of lint, or a pledget of tow, and introduce it into each section sufficient to fill it up, over which place linen strips, long enough to tie on the back of the tail, which is then tied sufficiently tight to restrain the bleeding. Should the bleeding, however, continue to be more than was anticipated, place another, rather broader, linen bandage over each section. It becomes necessary now carefully to watch these bandages, that they do not create too much heat and inflammation in the tail. Should this be the case, and the bleeding not be stopped, take a sponge which has been dipped in cold water, and squeeze the water on the top of the tail several times a day. This will cool the parts, and also tend to stop the bleeding. When perfectly satisfied on this point, loosen the bandages a little; and if all things look favourable, let the tail remain until the morning, when snip the bandage, and set the member free.

Many persons differ in their mode of after-dressing the sections. Some prefer lint only; others lint with the mild digestive ointment, and a bandage over all, in both instances. There is one advantage in dressing with the digestive ointment (see *Medicines*); and that is, it is apt to promote the suppurative process, while the other is not. By promoting suppuration, there is more chance of avoiding lock-jaw; but in the first dressing, nothing promotes the healing process so much as dry lint. Watching the wounds, that they be kept from dirt and fungus, leave them to heal of themselves, without any application but the bandages.

Were a nicked tail left to itself, there is no doubt but the divided muscles would again unite, and the tail be carried nearly as it was before. To keep the divided end apart, therefore, it is necessary that the tail should be suspended until the parts become cicatrised, and such junction prevented. In former days, a cushion, or pad, was formed, and fixed to the horse's rump, by means of buckles and straps, and the tail fastened back to this pad.

The Irish nicked horses may always be readily discovered from their having a peculiar curl-up at the end of the tail. This is caused by their having the last joint of the tail broken.

The modern mode of suspending the tail is by double pulleys, which is not only a simple mode, but a convenient one, as they are capable of being regulated at pleasure. The apparatus consists of two pulleys fixed to a beam or joist in the stable, as wide apart as the stall in which the horse is placed. The wheels of these are made sufficiently large to admit of a kind of roller—similar to one used for window-blinds—and about a foot, or a foot and a-half longer than the stall is wide. Another pulley, corresponding to the two others, runs loose on the roller, with this addition—that instead of having an end to fasten up anywhere, there is a larger wheel, but made only wide enough for the suspension cord to run on. This done, the end of the line must be made fast to the horse's tail, by means of first having introduced a good strong skewer through the plait, and double at the end of the tail. Then take another pulley, one end of which is to be fastened to a beam or joist, immediately behind the horse, and as far back as possible. The line fastened to the pulley on the roller is passed over the one just nailed up, and to the end of this line a weight is suspended. By this pulley being in a right line with the centre of the stable, the horse is in no danger of having his tail grow aside; but if he has a tendency to rest on one side of the stall more than on the other, take a bundle of furze, and nail against the side of the stall he may be so inclined to bear against, and *vice versâ*. The weight, for the first day or two, should not be more than will keep the tail straight; then, by

additional weight, elevate the tail a little from the horizontal line, advancing every two or three days, until it has attained the height desired; but never go to the perpendicular or erect position. The elevation, however, ought to depend on the height the tail is wished to be carried in future. The carriage of the tail should therefore be examined every two or three days; keeping in mind, that after the pulleys are no longer used it frequently droops a little.

With regard to giving the horse exercise during the time the tail is in pulleys, we should say it is decidedly wrong, and would cause the animal great and excruciating pain on being placed in them again. It would be very like tearing open an old wound. But there is a means of keeping him in health without exercise, by giving him an ounce of nitre in his water, two or three times a week, and an alterative powder (see *Medicines*) every day in his feed, which should be half bran and half oats, made moderately wet, so that the powders may easily adhere to it; not sloppy, that the medicine can run off.

Some attention will be requisite with regard to the tail, to prevent the hair coming off; but this will happen in some measure, no matter how great may be the caution used. At the end of about seven or eight days the tail should be taken out of the pulleys, and unplaited; then it should be carefully combed out, and a little hog's lard applied to the roots of the hair; when make fast again. This should be done every five or six days; and it is the only and best means to keep the hair on, though some cannot be prevented from falling off.

The only things now to be mentioned, are the casualties attending the operation of nicking, the principal of which is inflammation. This may run so high, as to produce mortification, lock-jaw, &c.; but as we have before treated of these specifically, there is no necessity for here repeating what has already been said, which will be found under their respective headings.

CROPPING.

Custom has nearly abolished the practice of cropping. Circumstances, however, may occur to render it necessary; such as one ear becoming blemished; therefore, at the makers of surgical instruments, we can always obtain a sort of curved clams, called cropping irons. Into these one of the ears is introduced, and the upper part is cut off at one stroke, with a knife of sufficient length. The portion cut off will serve as a guide for forming the other crop. In this operation a young practitioner is apt to be alarmed at the retraction of the skin from the cartilages; but the exposed edges disappear in a few days. Horses often continue for a long time very shy about the head after cropping; consequently, both bridle and halter should be used without a forepart or fronting, till the ears are quite well. The bridle should also be made to unbuckle on one side from the bit, so that the head-stall may be dropped on, without the hand being raised to pass over the ears. This will naturally operate in dissipating the customary shyness which otherwise so long remains, and which is never wholly lost, if force and cruelty be afterwards used. Gentle means will be always found to be best.

BLEEDING.

Bleeding is practised in several ways. Blood is sometimes taken from the arteries. If the trunk be considerable, it may be punctured, but must afterwards have a ligature passed around it. If it be less considerable, it will be sufficient to divide the trunk of the vessel, which having emptied all its ramifications, recedes by its muscularity within the integument, and the bleeding stops. The temporal artery is occasionally opened on both sides. These arteries may readily be detected at three or four inches below the root of the ear, in a line with the nostrils. The angular artery is sometimes opened for inflammation of the eyes.

Bleeding at the toe also abstracts blood from both veins and arteries. In drawing blood from the foot, it should not be done in the ordinary way of paring down the marginal line, with part of the sole, but the sole only, as close to the marginal line as may be; then a fine drawing-knife, or strong lancet should be taken, and the veins running round the margin of the foot punctured, when, from the great vascularity of the foot, the blood will flow copiously.

With regard to instruments employed to let blood, the common blood-stick and phleme, and a variety of lancets, are in use. The lancet is the most surgical-looking instrument; but, perhaps, the phleme is preferable in country practice, where necks of all thicknesses have to be contended with. We have seen some practitioners make one puncture through the skin first, then another through the coats of the vein; and without some experience the vein is also apt to be altogether missed, in attempting to do it with a lancet. The lancets and phlemes should be always clean, and highly polished; and, after bleeding, their points examined.

Blood is most frequently taken from the jugular vein, though there are other superficial veins, from which blood may be taken with advantage, such as the plate and thigh veins.

The proper place for bleeding at the jugular vein is about two inches below the branching off of that vein, towards the head. To perform the operation, the principal requirement is a steady hand. If the intention is to bleed on the near side, take the phleme in the left hand, and hold it with the finger and thumb. Then, with the middle and third fingers raise the vein by carrying the hand the backward way of the hair. The vein being raised as high as required, strike the phleme with the blood-stick in the centre of the vein. Let your assistant receive the flowing blood in a bucket, whilst you replace your tackle, and prepare, with a pin and tow, to bind up the orifice. This being done, let a wet sponge be applied, and remove the blood.

In abstracting blood, it should be an invariable rule never to let it fall on the ground. A bucket is generally the usual utensil for receiving it. By chance a graduated can is sometimes met with, in well-regulated stables; and exceedingly useful it is; as then you have a certain measure, by which you can regulate the quantity of blood wished to be taken away. You will frequently find you take much more on the graduated principle, than if you trusted to chance. As, for example, in a large horse, with a strong attack of inflammation upon him, on the first bleeding the recovery mainly depends. You are here working in the dark; for it will be next to an impossibility to ascertain what quantity of blood is taken, without some measure for a guide.

In all inflammatory affections, it is important to draw the blood from a large orifice, and as quickly as possible, though the general system may be weakened from hastily drawing blood. The disease, however, gives way to such treatment much quicker than if blood were drawn from a small orifice.

There are two kinds of blood-letting, termed *local and general.*

Local blood-letting is abstracting blood as near to the part affected as possible; and a few ounces thus abstracted frequently does more good than if a quart were taken from the system generally.

General bleeding is that wherein the system at large partakes of the operation, depleted by the stores more immediately derived from the heart.

Blood-letting, in veterinary practice, is very important. The amazing quickness with which some diseases run their course, and which appear to be only arrested by blood-letting, is, in many instances, to be considered as our only sheet-anchor; and therefore is so much resorted to in most fevers, and those internal inflammatory affections to which the horse is so exceedingly liable. Blood-letting is also important as a criterion of the state of the disease, certain appearances of the abstracted fluid presenting certain indications which act as a guide for future treatment. Indeed, if it were not from a knowledge of the different states of the blood and the pulse, we should be in continual error; therefore, the state of the blood in health, as well as in sickness, should be well attended to.

PURGING.

Purging, it is well known, is produced in the horse with the view to renovate him, and to bring him into condition; and though it may be treated lightly by a great many persons, still it is a very important matter, especially when we read of the number of race, and other horses, that annually fall victims on account of the bad management they receive during the time of their physic. Though almost every groom declares he can put a horse through his doses of physic as well as any man, yet, were he asked how the medicine acts, or, if things do not go on quite so well as expected, what is the reason, he is completely puzzled, and does not

know where to look for an answer, or how to explain the meaning of cathartic, or purging medicine.

Catharties, or purging medicines, act by stimulating the intestines to a more frequent evacuation of their contents. They also increase the matter so expelled; and, under some circumstances, alter the quality of it too. This being the simple operation of purging, it is evident that many erroneous notions are entertained relative to it.

Purging is used to reduce swelled legs; but no purgative will act on the legs immediately; for it cannot, in the first instance, remove fluids from any other parts but the stomach and bowels. Ultimately it may remove the fluids from other parts to make up the deficiency, and thus the legs become lessened.

Notwithstanding there are certain peculiarities of constitution generally, and certain states of the alimentary canal, which particularly render this process very salutary to the horse, and which are essentially necessary to keep him up to that standard of condition which is now the pride of every gentleman and sportsman; still, purging has its limits, and, if carried too far, which is sometimes the case by those ignorant of its effects, it ends in the serious injury, and even the death of the animal.

There are various uses to which purgative medicines become applicable, but they may generally be arranged under such as are given as remedies for existing diseases. Those exhibited as a preventive against a probable one also, are greatly used for promoting a certain state, called *condition*.

Catharties are most beneficially used against inflammation, and almost all diseases of increased action, except such as affect the alimentary canal. By increasing the waste of the watery parts of the blood, catharties tend to deplete the system, and to lessen arterial action. In active inflammation they greatly assist bleeding, and, in other cases, are superior to it, and can be advantageously employed when that cannot be, with propriety, attempted, as in fevers possessing a low or putrid character; for such appear to be often dependent on some morbid change within, or some morbid combinations formed by the biliary fluid, which purging acts particularly upon; so that its advantages here are striking. In plethoric cases, which produce serous deposits in the legs, &c., as in horses just removed from grass, we depend on purgatives for their removal. In pursy, thick-winded animals, physic not only prevents further accumulation, but also stimulates the absorbents to take up some of the existing deposit. In dyspeptic cases, in hide-bound, in lampas, and others, arising from the deranged functions of the stomach, mild purgatives act in the most salutary manner.

In the removal of worms, also, they act most beneficially, by ejecting them, as well as the nidus in which they are lodged.

As preventives, purgatives are extensively employed when horses are taken from grass, or the straw-yard, and at once removed into a heated temperature, covered with clothing, and fed with a full diet. Were it not for bleeding and purging, more particularly the latter, we should find all the consequences of plethora show themselves soon after; as hide-bound, surfeits, swelled legs, cracked heels, ophthalmia, and, not unfrequently, inflamed lungs also. Here, and in all similar cases, purgatives carry off the superabundant blood formed.

It is another fact, which serves to exemplify the absence of analogy between the action of purgatives on the horse and on the human subject. When an emaciated horse is removed from hard work, and harder fare, and at once put to rest and a full diet, so far from his condition being improved, unless he has been prepared for the change by previous purging, his skin becomes fixed, his belly still more and more tucked up, and his hair often actually falls off. The same change, when accompanied by a judicious use of purgatives, operates so much to his advantage, that in a few weeks he becomes almost a new animal.

Physic is also most beneficially given at particular seasons, as at the spring and fall, to obviate the effects of the different state into which horses fall at those times; being then apparently weak and emaciated, yet, at the same time, suffering from increased arterial action, employed in working the periodical change in the constitution. At these times, two or three mild purges will stimulate the defective digestion, remove morbid accumulations from the bowels, occasioned thereby, and,

by a sympathetic effect between the skin and the alimentary canal, they will assist in the change of the new hair for the old.

Purgatives are given to promote condition; and if their tardiness of action altogether shut them out from any other medicinal use, their beneficial influence in producing condition, would, of itself, render the subject important to all those connected with horses. If, likewise, they excited only the condition required in the young, the robust, and the already lusty animal, it would cause little surprise, and the method of action would be clear; but when we know that they equally promote it in emaciated animals, even without apparent disease, it requires an intimate acquaintance with the requisite functions of the animal, to enable us to account for the fact. In such cases we give mild doses only, which prove a valuable stimulant and tonic to the stomach and bowels, thus promoting their digestive powers, and consequent capability of separating more organic molecula from the ingesta. They also stimulate the sluggish biliary and pancreatic secretions, which are so necessary to a healthy digestion, and formation of chyle, from which alone strength and bulk can be augmented. Luxury and refinement have introduced an artificial state of condition beyond that; simply, a healthy functional state.

Such condition is not only necessary to bring the animal up to our present ideas of beauty, but also to enable him to undergo exercise, which, in a state of nature, was not expected from him, as hunting, racing, &c. To promote this state, purgatives are indispensably necessary; and it is from this view that the subject of physicking derives its popularity with the mere horseman: though we hold it in no less consideration under every point of view connected with the well-being of this valuable animal. In promoting condition, purgatives not only act favourably on the digestive organs, but their beneficial influence extends to the other solid and fluid parts of the body also. By their means the watery parts of the blood are removed, the absorbents become stimulated, and take up all the interstitial fluid interposed between the moving masses, as well as that distributed within the cellular membrane; and by this means strength is augmented, and the weight of useless matter diminished. The unnecessary adeps, or fat of the body, is also removed by the same process, which allows the muscular fibres to be more rectilineally placed, and, in their action, to be constantly gaining a greater increase of power. It is thus that physic draws up the belly, and hardens the flesh. The lungs also are enabled to act more advantageously by its agency, their capacity being greatly enhanced by the absorption of incumbering matter, either solid or fluid. In this way the wind, as well as the strength, is increased by perfect condition.

Salutary, however, as may be the operation of purgatives on horses, judiciously managed, and properly timed, yet hurtful in the extreme, and often fatal, are the consequences brought about by an ignorant employment of them, and an erroneous mode of managing them when they are employed. In all inflammatory affections of the stomach and bowels, cathartics must be highly injurious, except in inflammation of the bowels, when the obstruction cannot be overcome by any other means. They are almost equally hurtful in inflammation of the lungs; and it is probable, from the powers they call forth in the horse to produce purging, occasioned by his structural peculiarities, that in all great visceral inflammations, active purgatives should be admitted with caution. In farcy and glanders, they seldom do other than harm; and in chronic affections, attended with great debility, they are only admissible in some peculiar instances, specified in the treatment of such diseases. Physic is hurtful, however, principally from the frequency and quantity sometimes given. Grooms suppose that every ordinary case requires three doses; the reason for which, many have humorously thus given:—"The first being intended to stir up the humours; the second to set them afloat; and the third to carry them off."

To very young horses, and to delicate feeders, the giving of three doses of physic must be attended with most injurious consequences, and such as they cannot recover from for months; sometimes never. In such cases, one or two very mild doses are all that is required, or ought to be permitted; and it is doubtful, without some "foulness," as it is termed, or rather extreme fulness and plethora, whether, in ordinary cases, two moderate doses

be not all that is necessary to ensure the condition of saddle and carriage horses. It is an unfortunate prejudice, engendered by ignorance, and kept alive by obstinacy, "that to do much good with physic, it must be very strong." We have many times been told by grooms, that the dose of physic given could not be strong enough, for it had not purged the animal more than fifteen or sixteen times. In many cases, these knowing gentlemen are not satisfied unless a horse have from twenty to thirty evacuations. Super-purgation has destroyed hundreds of animals, and it has irreparably injured thousands. Extra purging debilitates the horse more than the human subject, probably from a lax state of bowels being more common in man, owing to the presence of both cystic and hepatic bile, as well as a dependent situation. It is hardly possible to conceive a more deplorable object than a horse under the action of a too strong purgative; the liquid aliments escaping almost involuntarily from his anus, excoriated with the violence and frequency of the ejections; the belly drawn to the flank, cold sweats bedewing the frame, appetite totally lost, and the strength so decreased as to leave the animal hardly the power of tottering from one stall to another: and yet to this state does the brutality and ignorance of a number of the old farriers doom the horses of their employers. The number and strength of the physicking doses are not the only evils to which the horse is liable, from improper purgation; the articles used are likewise of an injurious nature. Frequently, with the coarsest aloes, the groom's prescription directs gamboge, which greatly increases its drastic qualities. Neither, indeed, are these persons, or indeed some practitioners, so attentive to previous preparation as they should be.

A powerful dose of physic, given to a horse at hard work, and on full keep, without previous mashing, hurries the hardened fæces forwards, until they are formed into an impenetrable mass. Inflammation ensues, and on the third day the horse is found dead, and swollen immensely. In hot weather, inflammation supervenes on physic, when at all too active, and dysentery is a very common consequence of summer purging. When good physic has been properly given, it has been often rendered injurious, and even destructive, owing to the carelessness of the persons attending the animal. Cold water, at such times, must not be given; the door must not be left open, or a sudden chill may bring on inflammation of the bowels; also immoderate exercise must be carefully avoided, and only such given as will make the horse comfortably warm, and then he should be brought immediately into the stable.

Of the proper articles to be used in purging, a great discrepancy of opinion prevails; but if the distinction between laxative and purgative be maintained, it would tend to reconcile these differences. There are numerous articles which simply relax the bowels, *i. e*, slightly increase their peristaltic motion; but very few which produce active purgation. Of the former, bran, calomel, neutral salts, castor, linseed, and olive oils are the most usual; but it must be confessed, that with the exception of bran, all the others occasionally fail. There are some other medicines which act on the bowels, but they are not to be depended on as purgative medicines. The most proper we shall place at the end of this section.

The purgative for horses is, almost in every instance, aloes. Much difference of opinion exists on the preference due to the various kinds of aloes; nor can we ever arrive at a just conclusion on this subject, until we unite a conclave of *honest* druggists, both wholesale and retail, from whom alone something like a knowledge of the various sorts can only be expected. For all large horses, however, we should decidedly use the Barbadoes aloes for purging; and for small, thin animals, the Capo aloes. But neither large nor small horses should ever be attempted to be purged without first relaxing the bowels with bran mashes.

The quantity of aloes requisite for purgation is also very various, and must depend on the animal's customary food and constitution. This is a matter not to be wondered at, but, nevertheless, is a strong reason against leaving the management of purging to ignorant hands. Some horses are exceedingly difficult to purge, whilst others are easily affected. Old, generally require more than young animals, to purge them; and if at hard meat, it makes much difference in this respect. These facts serve to show the extreme necessity of pre-

scribing a very moderate quantity as the first dose for a horse with whose constitutional peculiarities we are unacquainted. The requisite quantity is also greatly dependent on various other circumstances. Horses fresh from grass purge with a much less dose than those long stabled; and for such as are used to bran mashes as daily food, a moderate quantity only is requisite; while in other instances, by mashing three times a day for several days, four or five drachms may do the work of eight. This shows the extreme importance of previous mashing, particularly in weakly horses, and also in such as have been previously accustomed to much hard food. Form, also, influences the quantity requisite. A thin, narrow-chested, lank-sided animal will purge more readily than a circular, deep-carcassed one. It may be considered, therefore, that the quantity required to purge horses, both prudently and effectually, ranges between five drachms and ten; the extent of which range will serve to indicate that something more is requisite than a blind acquiescence in any acknowledged receipt, or invariable form. Thus far as regards the account of aloes generally; we shall presently advert to them more particularly. For the formation of physic-balls, and the quantities required, see *List of Medicines*.

When it is thought proper to give mercurial physic for worms or skin affections, two drachms of calomel may be given in a mash the night previous, first mixed with a tablespoonful of flour. This, by lying all night in the horse, may, perhaps, assist its efficacy, particularly in case of worms; and the aloetic ball may be given the next morning; recollecting, at the same time, that it should be something less strong, on account of the calomel already administered. In giving physic, the intestines should always be prepared by bran mashes, which should be given two or three days previously; nor, indeed, should the physic be ever administered until the stools present some appearance of softening. The first dose given to an animal with whose constitution we are not well acquainted, should be a very mild one; for, as we have before remarked, some horses being so much more easily purged than others, it is necessary to use discretion; and if the dose does not operate, it can do no harm.

Exercise is of the greatest importance in physicking; but not to the severity of either trotting or galloping. Brisk and continued walking is all that ought to be allowed. Half the quantity of any cathartic, with sufficient of walking exercise, will operate nearly as much as a double dose without; so that the degree of purging may be always regulated nearly to our wish. When physic does not work kindly, the exercise should be repeated at short intervals—say two hours—until it does; and then it should be altogether omitted, in case of bringing on fatigue. Chilled water must be given, as it is particularly necessary to recollect that ample dilution of the bowels is of the utmost consequence to ensure the physic working kindly. Entice the horse, therefore, to drink by every means; and on no account forget the necessary precaution of giving him pure water from a perfectly clean pail. When it is either smoked or greasy, it cannot be expected that an animal possessing a delicate palate will drink. During the working of the physic he should be kept warm, both in the stable and by clothing; and he must be exercised (if in winter) in clothes proportioned to the cold.

When a purge is to be given, proceed as follows:—After having fed with bran mashes, for a day or two previous to the one in which you intend giving the ball, give the purge the last thing at night, keeping the animal warm. In the morning, when you come to the stable, offer him warm water, or chilled, but not cold. If you take him out to exercise immediately, the medicine, in all probability, will operate in the course of twenty minutes, or half-an-hour. When such is the case, go home at once, and give a handful of the best sweet hay you can procure. This will recruit his spirits, and he will then be able to eat his mash, which give in about an hour after. Cease now to exercise, until the physic is what is termed set, when feed in the usual way, until another dose is given. Why we recommend giving the medicine at night, is in consequence of its sometimes producing gripes, which generally come on in the night after the morning on which the medicine has been given, and which may cause inflammation of the bowels, and the death of the horse, when no one is present to attend to him. But if the medicine is given

as directed, at night, then there is the following day to watch him, and take advantage of anything that may occur.

It occasionally happens, that notwithstanding every attention, physic will not work on the second day; in which case, let nothing tempt the practitioner to give another dose immediately; for it sometimes happens that purgatives will not act until the third day. But when a case of non-purgation occurs, always wait until the third day, when, if no symptoms of purging appear, either let the horse rest altogether for two days longer, and then give him rather a stronger dose, or commence by administering to him a quarter of the original dose every six hours, till it purges; giving him mashes, exercise, and warm water, as before directed. Let it also be remembered, that it is erroneous to encourage liquid purging to twenty, thirty, or more dejections. No good attends this practice. We never wish any horse to have more than from twelve to thirteen liquid evacuations. All beyond this weakens the intestines, and injures him.

In the usual course of physic, on the next day after the operation of the purgative, the fæces will resume nearly their former consistency and shape, when the physic is said to be set. If it, however, continues to operate with nearly the same violence as on the day before, it must be regarded as *super-purgation*, and recourse must be immediately had to the treatment already directed for that disease. If otherwise, he may now return to his former habits, giving him corn at first rather sparingly, with moderate exercise; and, in five or six days from the physic setting, if the operation has been only ordinary, a *second* dose may be given, which is commonly required to be a *little* stronger than the first. After this, with the same caution, if it be deemed necessary, a *third* dose may be given, which is usually considered a course of physic; but the number of doses ought never to be under the arbitrary direction of custom, but should be regulated by existing circumstances.

FIRING.

Firing is performed for two purposes; one for the forming a permanent bandage, which it does by destroying the elasticity of the skin, and lessening its surface; the other for raising an active inflammation, and thereby exciting absorption. Sometimes it is used to answer one of these purposes only; and sometimes to promote both conjointly.

The Arabs fire the joints of their young colts to strengthen them, by the constant bandage the cicatrix forms to the part. Some English breeders of blood-horses have done the same; but it is rare.

In splents, spavins, and ring-bones, firing is used as a strong stimulus to the surrounding absorbents, to remove any extraneous substance recently deposited; hence the osseous matter which forms such swellings, becomes swallowed up by these vessels, and is thus removed. These are instances where firing is used, principally to promote external inflammation to relieve an internal one. But even here, the future pressure, occasioned by the cicatrix, is an assistant, and often a principal, in the removal of the adventitious deposit.

To increase the original inflammation, or to keep it up, it is common in these cases to apply a blister over the firing. In enlargement after violent strains we fire the legs, both to excite the absorbents and to remove the deposit of coagulable lymph; and also, by straightening the skin, to act as a permanent bandage on the part for the future. The various cases in which firing is considered necessary are dispersed through the body of this work; and it would be unnecessary to enumerate them here. We may observe, however, that as it is a painful operation, it should never be resorted to but when absolutely necessary; and the more so, as it leaves a permanent blemish. As blisters act in the same way, except that they leave no permanent blemish; so, when absorption only is required, their repeated application will often supersede the necessity of firing; and as they can be applied as often as wished, as promoters of absorption merely, they are, in many instances, greatly to be preferred. On the subject of blistering immediately after firing different opinions are entertained.

A morbid sensibility, or rather an affection of feeling, induces some to blame the adoption of such remedial agents as do not square with the popular outcry. A life devoted, as ours has been, to the amelioration of the miseries of some of the noblest of the brute race, prevents

us from inflicting unnecessary or needless pain on them; but when, by momentary addition to their suffering, years of future pain may be prevented, we would not court popularity by joining in decrying all painful operations.

When it is of consequence to keep up the irritation, or even to increase it, which we dare not do by deeper firing, or by lines too near each other, blistering, *immediately* after, is admissible. Such cases occur in long-continued enlargements, ligamentary, or osseous diseases; but, when firing is applied to four *stale* extremities, or even to two, which present only the ordinary appearance of disease, it is not only unnecessary, but it is wantonly cruel. It is also dangerous, and has proved destructive.

The mode of firing differs according to circumstances. The general mode adopted at the Royal Veterinary College is in straight lines, up and down the course of the hair, or in perpendicular lines; the reasons for this are well known. If it be applied as a bandage, in no direction can it corrugate the skin in so effective a manner, as by lines drawn inversely to the action, as well as the enlargements of the parts. As the principles of the firing-iron have become perfectly known, it is unnecessary to expatiate upon them here.

As there are several methods of firing, so are there several kinds of irons used for it, of various shapes. The principal are, the *searing-iron*, which is used for the tail, and which is probably called into request more frequently than any other. Then the *budding-iron*, for touching cavities, and searing farcy-buds. There is, also, the common firing-iron, the iron to remove lampas, and some others, according to the particular purposes for which they may be required. To practitioners these are all pretty well known, and all should be tolerably thick at the back to retain the heat; and, when used, should only be heated to a dull-red heat.

When performing the operation of firing, care should be taken to have a piece of board near, to rub the edge of the iron on. This will prevent its getting too sharp, and cutting through the skin. The iron, also, by this means becomes cleared of all scales, which would be a very great interruption to the operator if he had no means of speedily removing them.

Firing is not so simple an operation as many persons are inclined to consider it; for, if the true skin is penetrated, a wound is produced, and great inflammation and ulceration may result, and leave a bad blemish. To prevent this, if the iron be made very hot, it must be passed very quickly and lightly over the parts; then, as it gets cool, it can be drawn more at leisure; and, if the parts should not be level, they must be lightly touched over again, in order to make the whole look well. Ring-bones, or old spavins, require the most severe firing, and are even then not very successfully treated. We have, in that case, fired a second time, which, in many instances, has had the desired effect. In all cases of firing, the hair must be closely clipped off the parts, for the smoke arising from burning is apt to confuse the operator.

We have heard of some operators chalking out the lines first; but we never saw such a practice. After the firing is completed, a mild blister ointment should be lightly applied to the parts; after which the animal should have rest, and not immediately be put to work

BLISTERING.

Blistering is an operation of great utility, and, when attended with care, it is as safe a one as can be performed. It acts more as a local blood-letting, if care be taken to lance the vesicles as they may arise; for, if these are not quickly removed, the serum may become again absorbed, and the surface restored by a slight effort of inflammation, without having the desired effect. They then become more like what is called *sweating-blisters*, because the cuticle, or scarf-skin, does not rise; but when, by continued irritation, or by rupturing the vessels, the cutis becomes exposed, suppuration succeeds, and the part becomes thoroughly blistered.

The salutary action of blisters depends, first, on the stimulus they give to the absorbents; and next, on the inflammation they excite, proving a counter-irritant to some other part. They act in the removal of injurious deposits, as enlargements arising from strains of the back-sinews, or ligaments; sometimes they do good when applied to spavins or splents; but, should either of these diseases be of long standing, stronger applications must be had

recourse to, or the milder blisters used, and repeated every day. Mercurial ointment, well rubbed in on any bony excrescence, for a day or two previous to applying the blister, will greatly tend to promote the absorption of the offending parts.

In inflammatory affections, we find blisters of great importance, acting as counter-irritants; and it appears singular that two inflammations seldom exist in the neighbourhood of each other; therefore, when such an affection has taken place in any part, and it is desired to be removed, we raise an artificial inflammation in its neighbourhood by means of blisters. In inflammatory affections of the lungs and bowels, it is proper to blister the chest, belly, &c., by which means the inflammatory action may be shifted from the vital organs to parts of less importance; for if a horse affected with inflamed lungs be blistered either in the chest or belly, and if the blister does not properly rise, he will probably die of sheer debility. The blister ointment generally ought to be bought at the druggist's, as it is sometimes made of such irritating materials, that the animal is put to the most excruciating pain imaginable, when we well know that the blistering property lies in the cantharides only.

Before applying a blister, the hair should be cut off as closely as possible from the part, and around it. The blister ointment should then be well rubbed in for ten or fifteen minutes, on which thorough application of it, its operation mainly depends. Having done this, smooth the hair downwards, and spread a little more ointment on the surface, with a spatula. If there is occasion to blister the pasterns and fetlocks, apply a little hog's lard to the hollows of the heels. This will often prevent the formation of grease or troublesome sores from the discharge of the blister falling on these parts.

Another caution is, that when a blister is acting, the litter should all be removed from under him, lest the straws tickle and irritate his legs so much, that he may not only attempt to gnaw them, but strike them against the manger, or one against the other. To prevent this, the horse must be tied up to the rack for at least two days, when the principal irritation will have left him. But never blister without putting a cradle round his neck. It will prevent him biting his legs, or attempting to do so. Cradles may generally be had at most of the turners' shops; or, should there be an obligation to make one, take eight or ten pieces of broom or mop-handles, and cut them into lengths of about two feet long, and make holes in both ends, so that they may be threaded with a piece of strong cord, and then fasten them around the horse's neck. The horse then becomes effectually prevented from biting or tearing himself. If blistering once does not answer the purpose anticipated, and you determine to blister again, first wash off, with soap and water, all scurf that may have been left by the first, before applying the second blister. When it is intended to turn a horse out after blistering, care should be taken that all the parts are healed, or flies and dust may get into the sores, and become exceedingly troublesome.

Sweating blisters are generally of a milder nature than others, and in consequence frequently applied.—(See *Blistering Liniment*).

CHAPTER XXXVII.

RESTIVENESS.—TAMING SYSTEMS PURSUED BY THE "JUMPER," THE "WHISPERER," MADAME ISABELLE, AND MR. RAREY; VICES.

It has been said of naturally vicious horses, that however they may have been cowed and temporarily subdued by some master spirits, they are never to be depended upon; but will

return to their dangerous practices on any opportunity which their caprice may dictate, or chance may throw in their way. The following statement of facts quite bears out this opinion, and shows the danger of keeping any naturally vicious animal, under the impression that he may become quiet and harmless.

Restiveness may be considered the effect of bad temper, and, perhaps, worse breaking; and like all other habits founded on nature, and fixed by an evil education, it may be considered inveterate. Whether it appear in the form of kicking, rearing, plunging, or bolting, or in whatever way it may threaten danger to the animal or its rider, it rarely admits of a cure. It may be true, that a resolute and determined rider may, to a certain degree, subjugate the animal; or the horse may form his attachments, and, with some particular person, become comparatively, or perfectly manageable; still we believe it to be a rule that admits of very few exceptions, that he neither displays his wisdom, nor consults his safety, who thinks he has so far subdued a restive horse, as to be able, at all times, to repose trust in him.

An excellent veterinary surgeon, and a man of great experience in horses, says, in *The Veterinarian*—"From whatever cause the vicious habits of horses may originate, whether from some mismanagement, or from natural badness of temper, or from what is called in Yorkshire, a *mistetch*—whenever these animals acquire one of them, and it becomes in some degree confirmed, they very seldom, if ever, altogether forget it. In reference to driving, it is so true, that it may be taken as a kind of aphorism, that if a horse kicks once in harness, no matter from what cause, he will be liable to kick ever afterwards. A good coachman may drive him, it is true, and may make him go, but he cannot make him forget his vice; and so it is in riding. You may conquer a restive horse; you may make him ride quiet for months, nay, almost for years together; but I affirm, that under other circumstances, and at some future opportunity, he will be sure to return to his old tricks again."

This writer gives two singular and conclusive instances of the truth of this doctrine. "When a very young man," he says, "I remember purchasing a horse at a fair in the north of England, that was offered very cheap, on account of his being unmanageable. It was said that nobody could ride him. I found that the animal objected to have anything placed on his back, and that, when made to move forward with nothing more than a saddle on, he instantly threw himself down on his side with great violence, and would then endeavour to roll upon his back.

"There was, at that time, in Yorkshire, a famous colt-breaker, known by the name of 'Jumper,' who was almost as celebrated in that country for taming vicious horses into submission, as the famed 'Whisperer' was in Ireland. I put this animal into 'Jumper's' hands, who took him away, and in about ten days brought him home again, certainly not looking worse in condition, but perfectly subdued, and almost as obedient as a dog; for he would lie down at this man's bidding, and only rise again at his command, and carry double or anything. I took to riding him myself, and may say, that I was never better carried for six or eight months, during which time he never showed the least vice whatever. I then sold him to a Lincolnshire farmer, who said that he would give him a summer's run at grass, and show him a very fine horse at the great Horncastle fair.

"Happening to meet this gentleman the following year, I naturally enough inquired after my old friend. 'Oh,' said he, 'that was a bad business—the horse turned out a sad rebel. The first time we attempted to mount him, after getting him up from grass, he in an instant threw the man down with the greatest violence, pitching him several yards over his head; and, after that, he threw every one that attempted to get on his back. If he could not throw his rider, he would throw himself down. We could do nothing with him, and I was obliged at last to sell him to go in a stage-coach.'"

In the next story, "Jumper's" counterpart, and superior, the Irish "Whisperer," is brought on the stage, and, although he performs wonders, he cannot radically cure a restive horse. "At the Spring Meeting of 1804, Mr. Whalley's 'King Pippin' was brought on the Curragh, at Kildare, to run. He was a horse of the most extraordinarily savage and vicious disposition. His particular propensity was that of

flying at and worrying any person who came within his reach; and if he had an opportunity, he would get his head round, seize his rider by the leg with his teeth, and drag him down from his back. For this reason he was always ridden in what is called a sword; which is nothing more than a strong flat stick, having one end attached to the cheek of the bridle, and the other to the girth of the saddle, a contrivance to prevent a horse of this kind from getting at his rider.

"King Pippin had long been difficult to manage, and dangerous to go near; but on the occasion in question, he could not be got out to run at all. Nobody could put the bridle upon his head. It being Easter Monday, and, consequently a great holiday, there was a large concourse of people assembled at the Curragh, consisting principally of the neighbouring peasantry; and one countryman, more fearless than the rest of the lookers-on, forgetting, or, perhaps, never dreaming that the better part of courage is discretion, volunteered his services to bridle the horse. No sooner had he committed himself to this operation, than King Pippin seized him somewhere about the shoulders, or chest, and shook him as a dog would shake a rat. Fortunately for the poor fellow, his body was very thickly covered with clothes, for, on such occasions, an Irishman of this class is fond of displaying his wardrobe; and if he has three coats in the world, he is sure to put them all on.

"This circumstance, in all probability, saved the individual who had so gallantly volunteered the forlorn hope. His person was so deeply enveloped in extra clothing, that the horse never got fairly hold of his skin; and I understand that he escaped with but little injury, beside the sadly rent and totally ruined state of his wardrobe.

"The 'Whisperer' was sent for, who, having arrived, was shut up with the horse all night, and, in the morning, he exhibited this hitherto ferocious animal, following him about the course like a dog; lying down at his command; suffering his mouth to be opened, and any person's hand to be introduced into it; in short, as quiet as a sheep.

"He came out the same meeting, and won a race, and his docility continued satisfactory for a long time; but, at the end of about three years, his vice returned, and then he is said to have killed a man, for which he was destroyed."

It may be interesting to give some account of this extraordinary tamer of equine vice.

The Rev. Mr. Townsend, in his *Statistical Survey of Cork*, first introduced the "Whisperer" to the notice of the public generally, although his fame had, long before, been spread over that part of Ireland. He is mentioned also in *Croker's Fairy Legends and Traditions of Ireland*. The following is an extract from that work:—

"He was an awkward, ignorant rustic, of the lowest class, of the name of Sullivan, but better known by the appellation of the 'Whisperer;' his occupation was horse-breaking. The nickname he acquired from the vulgar notion of his being able to communicate to the animal what he wished by means of a whisper, and the singularity of his method, seemed in some degree to justify the attribute. In his own neighbourhood, the notoriety of the fact made it seem less remarkable; but I doubt if any instance of similar subjugating talent is to be found on record. As far as the sphere of his control extended, the boast of *veni, vidi, vici*, was more justly claimed by Sullivan than by Cæsar himself.

"How his art was acquired, and in what it consisted, is likely to be for ever unknown, as he left the world without divulging it. His son, who followed the same trade, possessed but a small portion of the art, having either never learned the true secret, or having been incapable of putting it into practice. The wonder of his skill consisted in the celerity of the operation, which was performed in privacy, without any apparent means of coercion. Every description of horse, or even mule, whether previously broken, or unhandled, whatever their peculiar habits or vices might have been, submitted without show of resistance to the magical influence of his art, and in the short space of half-an-hour became gentle and tractable. This effect, though instantaneously produced, was generally durable. Though more submissive to him than any others, they seemed to have acquired a docility unknown before.

"When sent for to tame a vicious beast, for which he was either paid according to the dis-

tance, or generally two or three guineas, he directed the stable, in which he and the object of the experiment were, to be shut, with orders not to open the door until a signal was given. After a *tête-à-tête* of about half-an-hour, during which little or no bustle was heard, the signal was made, and, upon opening the door, the horse appeared lying down, and the man by his side, playing with him like a child with a puppy dog. From that time he was found willing to submit to any discipline, however repugnant to his nature before."

"I once," continues Mr. Townsend, "saw his skill tried on a horse which could never before be brought to stand to be shod by a smith. The day after Sullivan's half-hour's lecture, I went, not without some incredulity, to the smith's shop, with many other curious spectators, where we were eye-witnesses of the complete success of his art. This, too, had been a troop horse; and it was supposed, not without reason, that after regimental discipline had failed, no other would be found available. I observed that the animal appeared terrified whenever Sullivan either spoke or looked at him. How that extraordinary ascendancy could have been obtained, it is difficult to conjecture.

"In common cases this mysterious preparation was unnecessary. He seemed to possess an instinctive power of inspiring awe, the result, perhaps, of natural intrepidity, in which, I believe, a great part of his art consisted; though the circumstance of the *tête-à-tête* shows that, on particular occasions, something more must have been added to it. A faculty like this would, in some hands, have made a fortune; and I understand that great offers were made to him for the exercise of his art abroad. But hunting was the passion of Sullivan. He lived at home in the style most agreeable to his disposition, and nothing could induce him to quit Duhallow and the fox-hounds."

Mr. Castley, a writer in the *Veterinarian*, witnessed the total failure of the younger Sullivan. He says—"We have in the regiment a remarkably nice horse, called Lancer, that has always been very difficult to shoe; but seven or eight years ago, when we first got him, he was downright vicious in that respect. When the regiment was stationed at Cork, the farrier-major sought out the son of the celebrated 'Whisperer,' and brought him up to the barracks, in order to try his hand upon Lancer, and make him more peaceable to shoe; but I must say this person did not appear to possess any particular controlling power over the animal, more than any other man. Lancer seemed to pay no attention whatever to his charm; and, at last, fairly beat him out of the forge. Time, however, and a long perseverance in kind and gentle treatment, effected what force could not. The horse became pretty quiet to shoe."

Did we not know, from the recent performances of Mr. Rarey, that such things are possible, it would seem almost incredible, that a man being left only one night in King Pippin's stable, should have produced such an alteration in that animal's ferocity. It is said some have the power of disarming the rage of the most savage dogs; and the "Whisperer" appears to have found out the same charm for the vicious horse.

"Jumper" seems to have had extraordinary power over other animals besides the horse; for he is said to have tamed a buffalo for the saddle, for Mr. Tempest, and a pair of reindeer for Lord Fitzwilliam. The manner of his treatment seems sufficiently intelligible. His charm consisted chiefly in fearlessness and brute force. He would generally try rough measures first; and in his perilous encounters with some of these troublesome animals, had nearly every bone of his body fractured. "Jumper," however, seemed to have some sort of magic about him; for it is said, when he had, by dint of punishment, striven in vain to conquer an unruly horse in the market-place of Wakefield, he alighted, stood on the near side of the animal, brought the head almost back to his off-shoulder, by forcibly pulling at his off-rein, and then sternly gazed at him over the withers for two or three minutes. The animal began to tremble, and broke out in a profuse perspiration. "Jumper" then loosened his hold of the rein, and patted and caressed him, and was immediately followed by him round the market-place, perfectly subdued.

"Jumper" is described as having been employed in the contested elections for Yorkshire, covered with orange plush from top to toe, and scampering in every direction over the

county. Sometimes he would exchange this costume for a bear-skin, enveloped in which, and mounted occasionally on a buffalo, he was indeed a most formidable looking object.

This power of fixing the eyes upon the face of any animal, seems to have an almost overwhelming effect of bringing them into a state of subjugation. It was but the other day that we read, in an American paper, of a Yankee exhibiting himself as a snake-charmer. The manner in which he proceeded was thus detailed – "A tall, bony, Yankee-looking foreigner, last from California, made his appearance in Virginia, with a box of snakes—rattlesnakes, moccasins, black snakes, vipers, &c. He collected a crowd around him, though at a respectful distance, and grasping with both hands a bunch of snakes, coiled them round his neck, and thrust them into his bosom, as if they were strands of silk or cotton. Their twistings and turnings seemed to give him pleasure, while the by-standers were filled with very opposite emotions. He professes to tame his savage friends by means of mesmerism, and thus fights the rattlesnake with his own weapon. Some in the crowd suggested that he should take a wild, untamed snake, and show his power over it, which he agreed to do for twenty-five dollars. This sum was readily subscribed, and a rattlesnake, caught the day before, was soon procured. The operator examined him with some caution, but presently turned the box over, and threw the venomous reptile upon the green sward. He kicked him about several times, caught him by the tail, and threw him back and forth, and finally seized him in the middle, and held him at arm's length. The snake turned his head towards him, and their eyes met; the latter fixed his gaze steadily upon the snake, and kept it so for several minutes, when he suddenly coiled it round his neck, thrust it in his bosom, as he had done the others, and the snake seemed entirely docile. Two days after he repeated his experiment, for twenty dollars, on a large rattlesnake which had just been caught, and with similar results. A crowd of ladies and gentlemen witnessed the singular exhibition. It was painful to behold, though the individual seemed to have the most entire confidence in his ability to control the horrid animals."

The system of Mr. Rarey now demands our attention.

The taming method pursued by this American gentleman has been considered very successful; at least, it has received an extensive patronage in this country. He begins to make the acquaintance of the colt when at pasture, and by the mildest means, and, almost without any physical signs, entices the animal to enter a stable, barn, or out-house, in the immediate neighbourhood. An old horse is then let in, and the colt is, without any stir, surrounded, and left alone with the operator. Nothing of life is then permitted to be in his presence save the man who has to tame him, and who strives to absorb the whole of the attention of the animal. Gentleness becomes the rule. Everything calculated to excite fear, or raise alarm, is discarded from the appearance and conduct of the man, who approaches the animal holding out his hands, and speaking to him in the softest tones. By-and-by the colt gains confidence, and will approach him, and smell his hands, when he must take the opportunity of first stroking the nose, and then the face, cheeks, and neck. When the colt has yielded itself entirely to this kind of treatment, a leathern belt is very quietly passed up and on to his head, which is the first step towards real subjugation. For this purpose a rope halter should not be employed, being objectionable because of its coarseness. When this is accomplished, a plain, smooth snaffle-bridle, with a moderate-sized snaffle-bit, is passed into the mouth, and fitted to the head. All this must be done without hurry, and nothing whatever should be allowed to move or agitate the feelings of the animal. When this has been done, the next point is to handle, with the utmost gentleness, the neck, shoulder, and near fore leg. After this, the shank is taken in the palm of the hand, and the foot raised from the ground. This movement is assisted by pressing the back sinew with the finger and thumb, or by turning the colt's head and neck well to the left. When the foot has been once stirred, the operation must be repeated until the animal will permit the foot to be bent near to the elbow-joint, and to be kept for a time in that position. The body is next handled, the hand passing along to the hind quarter and leg. The hind

leg must now be raised as high as possible, and the tail well handled. The same process is then to be carried out on the left side of the colt, which concludes the handling. Should any disposition to restiveness be exhibited on the part of the colt, both of the fore legs must be immediately strapped up, and the animal brought to the ground upon his knees. If there is not about the depth of a foot of straw on the ground, knee-caps should be employed for protection. For the near fore leg, the strap should be an inch in breadth, and about three feet in length. When the colt is strapped well up, he is induced to move about on three legs, the bridle being used in such a manner as to effect this. When the animal becomes reconciled to this condition, the handling of the body and hind legs is again proceeded with. When this is borne with sufficient patience, a surcingle or roller should be fastened round the body. Should there be any restiveness shown by the animal while bending up the near fore leg alone, the off fore leg must at once be proceeded with.

The strap for this purpose must be about six feet in length, of the thickness of a strong rein, and about an inch or an inch and a quarter in width. It has a loop of three inches, or a metal D at one end. The loop or D is passed round the pastern of the off fore leg, the point of the strap taken through it, and the strap drawn tight to the pastern. The point of the strap is then carried within the surcingle or roller, and held tightly in the right hand. When the operator is desirous of raising the off fore leg, he inclines the head of the colt, by the aid of the bridle, to the right or left hand; and the instant the foot is removed, it is drawn up to the surcingle with force, and retained in that position, if possible. Generally speaking, a succession of violent plunges will succeed the fall, during the whole of which the person must retain his hold upon the leg; and, by placing his shoulder to the near forehand of the horse, with a strong bearing upon the off-rein to bend the head and neck outwards, so that the animal cannot collect with advantage his muscular force, he is soon compelled to yield up the contest.

When the animal has become quiet, the head, neck, body, limbs, and tail, should be handled in succession, until he is completely resigned to the process, and several opportunities should be taken to sit down upon the body, the forehand, and the hind quarters. Whilst this is going on, the saddle, without girths, or stirrups, may, for a short time, be placed on the body, or the harness laid upon the hind quarters. When you have to deal with a Zebra, or a horse as savage and wicked as "Cruizer"—a horse that can kick as fiercely from one leg, as others can from two—in that case, to subdue and compel him to lie down, have a leather surcingle, with a ring fastened to the belly-part; buckle the hobbles on the hind legs, and pass the ropes through the ring. When the horse is thrown down by strapping up the fore legs, the hind legs must be drawn close up to the ring in the surcingle. By-and-by the animal becomes quite tamed, and is thoroughly subdued. Gentleness, as far as it can possibly be practised, is the rule in Mr. Rarey's system; and in no case is the whip or stick used, if it can be avoided.

We now come to the system of Madame Isabelle, who received testimonials from almost all the continental authorities; and her success at the cavalry depôt at Maidstone was unrivalled and unquestioned. She there broke-in a horse in six lessons, the property of Lord Granville; and the feat was accomplished in the presence of the Duke of Wellington, Lord Zetland, General Murray, and others. But what was more extraordinary, she caused the horse to be broken-in by the groom of Lord Granville, whom she instructed at the same time in equitation. On one occasion she had a mare, which had the bad habit of taking a branch of the bit between her teeth, which were by no means easily re-opened—and running away with her rider, according to her own good will and pleasure. She "stood over" before, and "out" behind; in consequence of the abuse of the "bridoon," her houghs were in very bad condition, although well-shaped. Madame Isabelle undertook, nevertheless, to bring them round and break her in, which certainly was not an easy task, when the temper and physical defects of the brute were considered. She succeeded, however, to a most extraordinary degree, and finally made her "coquette" as elegant an animal

as could be seen. It was upon this animal—which Madame Isabelle considers rightly named, from the character above given, and other little incidental pleasantries, such as making the "clack of her teeth heard," and "exhibiting her foot in the air"—that the action of the "Surfaix Cavalier" was first tried; and the success obtained so proved the excellence of the system, that the fair "hippodamast" at once adopted it. In a work which she has published on the subject, she says—"I subsequently applied this action to horses of all ages and of every description, and discovered its infallibility, inasmuch as it succeeded without one single exception; but as this action was produced by the hand, it became very fatiguing, and also could not be produced with absolute certainty, because great tact was necessary. I then invented the 'Iron Cavalier.' I had well calculated all its desired effects, so as to produce exactly the action of the hand of an accomplished horseman, but with the great superiority arising from its fixed position, and its direct effects upon the salivary glands, the size of which it diminishes considerably. Thus with me the 'Surfaix Cavalier' solved the problem of breaking-in."

The following explanation of this lady's system is slightly altered from a review of it in *The Field*:—

The "Surfaix Cavalier," the instrument by which Madame Isabelle produces such an effect, is the ordinary surcingle, which is put on over the saddle; and if the horse is shaped in the usual way—that is, where the loins are neither long nor weak, nor the withers very high—the saddle should be placed four inches behind the shoulder. There is a steel band inserted on either side of the girths, which extends from the near to the off side. The "Iron Cavalier" is a flat iron rod, nearly sixteen inches in length, which is fixed upon the centre of the "surfaix," or surcingle, upright, with a slight inclination forwards. There are four cross-bars on either side of the centre rod, each about four inches long, terminating in circular holes for the insertion of the reins: each pair is nearly four inches apart from the others, the uppermost cross-bars being at the extremity of the central rod, which, as stated before, stands up nearly sixteen inches in height. The cross-bars range across the body of the horse; the circular holes are marked in pairs, 1, 2, 3, 4; No. 1 being the lower pair, No. 4 the upper. There are four reins, each about eight feet long, and at one end punched with holes marked from one to twenty-four, which are about 1¾ inches apart, giving a range for tight or loose reins. The bits are made to be effective, but not punishing. The cavessons are lighter than usual; and, during the operation of breaking-in, the ordinary bit and snaffle reins are always put on, in addition to those belonging to the "Surfaix Cavalier."

These are the instruments used by Madame Isabelle; the "Iron Cavalier" being an improvement, and a very great one indeed, upon the old "dumb jockey," the effect of which was to act like a stiff and rigid band upon the ribs; while the action of the "Iron Cavalier" is only felt on the steel bands in the girth when the horse draws too tightly on the reins; the movement of these steel bands having the same effect as the rider's legs should have. With these remarks, we proceed to the instructions laid down by Madame Isabelle for the breaking a saddle-horse in twelve lessons, whether mounted or not.

There are twenty-seven lessons laid down as necessary for a horse to go through before he can be considered thoroughly broken-in. It will give a clear idea of the routine, to enumerate these in their order, as they are constantly referred to in the practical working out of the object. The first gives directions "to saddle and bridle" a horse, and place the "Surfaix Cavalier." No. 2, "to lift the fore legs; to free the action of the legs." This forms the important lesson of suppleing a horse, or, as it may be literally termed, it is teaching him the use of his legs. No. 3, "to lead a horse to the riding-school." No. 4, "*Pas d'équilibre decomposé*, forward and backward." "This movement has for its object, to accustom the horse to the man, and to make him quiet and attentive, two things indispensable to proper breaking; to habituate him to the support of the bit, and the action of his jaws upon it; to divide his powers equally and regularly; to 'lead' with the proper foot in all his paces; to prepare him for the gallop, and to rein back readily." Nos. 5 and 6, "to bring a horse to the knowledge of the whip

and the long whip." Nos. 7 and 8, "to bring a horse to the knowledge of the spur, and to start by diagonal action." Nos. 9, 10, 11, and 12, are respectively "the flag, the drum and pistol shot, the music, and the sabre lesson." No. 13 is headed "left-about—right-about." Nos. 14 and 15, "pirouette on the forehand and on the haunches." Nos. 16, 17, 18, 19 are for "movements of the two *pistes* or tracks," which is effected by teaching a horse to cross the near legs over the off legs, taking generally an oblique direction. This movement is commonly called the "passage," incorrectly, according to Madame Isabelle. No. 20, "to start at a walk and at a trot;" No. 21, "to produce a noble carriage;" No, 22, to "rein back" a horse; No. 23, "to teach the effects of the reins on starting at a gallop;" No. 24, to "*rassembler*" a horse. This exercise, with No. 2, are the two principal ones for what may be termed putting a horse on his legs. No. 2 is to make the horse's limbs supple by teaching him to lift his legs properly. To "*rassembler*" may be called keeping a horse together. The horse's croupe is placed against a wall, so that he cannot go back; and in this position, by means of the whip and the click of the tongue, he is made to move all his legs readily. Nos. 25 and 26 are jumping and mounting lessons; and No. 27 is the climax of all—the Riding Lesson.

In reference to these lessons, Madame Isabelle quaintly observes—"If it is not possible to have a riding-school—a courtyard, a corner of a garden, or even the highway will suffice for want of a better substitute." And it is stated as a positive rule, that "all the lessons should be an hour and a-half long during the whole of the breaking-in." In the first lesson, after saddling and placing the "Surfaix Cavalier" on, the reins must be fixed in the first holes, and the horse is exercised in No. 5, the whip lesson; No. 4, the *pas d'équilibre decomposé;* and in No. 14, the pirouette on the shoulders. In the second lesson, the bit reins are fixed in the second holes, the snaffle reins in the fourth holes. In addition to those exercises in the first, the horse is put to No. 16, the movement of the two *pistes*, and No. 20, the starting at a walk or a trot. In Lesson 3, the four reins are fixed in the seventh holes, and No. 17, the movement of the two *pistes* with the lunge and the whip, and No. 22, the "rein back," are brought into play. In Lesson 4, the four reins are fixed in the eighth holes. The horse is taught No. 6, "the knowledge of the long whip," and No. 18, the movement of the two *pistes* with diagonal action. In Lesson 5, the four reins are fixed in the tenth holes. The horse is made acquainted with the use of the spur. He is also made to "*rassembler*" (No. 24), and to go through No. 13 and No. 18. In the sixth lesson, the four reins are fixed in the twelfth holes; and Lessons Nos. 8, 21, [illegible] 23 are added to the operations. In the seventh lesson, the reins are fixed in the fifteenth holes, and all the preceding operations are repeated. In Lesson 8, the four reins are fixed in the sixteenth holes, and the horse is "*rassembled*" and "reined back," and then is put to No. 19, the movement of the two *pistes*, the body being bent to the side to which the horse moves; but for this the reins are changed, the near bit and snaffle reins are fixed in the eleventh holes, and the off bit and snaffle reins in the sixteenth. In the ninth lesson, the reins are fixed in the eighteenth holes. The horse goes through all the preceding exercises, and is now taught to jump, No. 25. The three last lessons are devoted to repetitions, the only difference being in the reining up; and the horse is then considered thoroughly broken-in and fit for the riding lesson —when, instead of the "Iron Cavalier," a soldier appears in the saddle, and every direction is given for teaching him equitation.

We have thus entered somewhat minutely into the system of Madame Isabelle, in order to show of what it consists. The directions are very minute; so much so, indeed, as in some cases to appear not to be required. But it has been proved by experience, that this aggregate of minute points is essential for realising the great object—namely, the speedy and perfect breaking-in of the horse. Of the horses in this country, Madame Isabelle observes, that the English use them, but do not break them in, and thus it is that so many are rendered vicious; and, if the cause is sought, "*it will be seen that it has arisen, amongst the greatest number of them, from the injustice and brutality of which they have been the victims*" —an additional evidence to the fact, that gen-

tleness or humanity, whether applied to man or beast, is a much better breaker-in than cruelty or barbarity. This new system offers every advantage that can be desired; it breaks-in the horse quickly, without fatiguing him in the least; develops his powers, enlarges his action, increases his speed; renders him supple and elegant, gives him a perfect mouth, and makes him also docile and confident with men. There is also another very material point—that "the breaking-in of the horse, and the instruction of the man are so intimately connected, that while training the animal, the man cannot fail to teach himself."

We will now proceed to remark upon some of the most prominent vices of the horse.

When a horse begins to *gib*, persuasion should be first tried; and, afterwards, reasonable coercion, but no cruelty; for the brutality which is often exercised in attempting to compel a gibbing horse to throw himself habitually in the collar, never yet accomplished the purpose. Such an animal may be put in an omnibus as a wheeler, and particularly as the near-wheeler; or in the middle of a team at agricultural work; and in these situations he might be serviceable, but nowhere else. It will be useless for him to attempt to gib there, for he will be dragged on by his companions whether he will or not; and finding the inutility of resistance, he will soon be induced to work as well as any other in the team. This reformation will last while he is thus employed; but, like restiveness generally, it will repossess him when he returns to his former occupation. Some instances of complete reformation have taken place; but they are the exceptions to the rule.

When a horse, not accustomed to gib, betrays a reluctance to work, humanity will demand that some examination should take place, before measures of severity be resorted to. Sometimes the withers are wrung, and the shoulders sadly galled; and the pain, which, even with a fair draught, may be intense on level ground, becomes insupportable when going up a steep acclivity. These things should be observed, and, if possible, rectified; for, under such circumstances, severe punishment might produce obstinacy and vice, but not willing obedience.

A horse, with raw shoulders, or that have frequently been so, will not start with a cold collar. When the collar has acquired the warmth of the parts on which it presses, the animal will go without reluctance. Some determined gibbers have been reformed by constantly wearing a false collar, or strip of cloth round the shoulders, so that the coldness of the collar should never be felt; and others have been cured by keeping on the collar night and day, although the animal is not able to lie down so completely at his ease, as without it; and this a tired horse ought always to be able to do. When an animal gibs at his work, it has sometimes been useful to line the collar with cloth instead of leather; the perspiration is more readily absorbed; the substance which presses on the shoulder is softer, and it is more readily eased off at a tender place.

Biting may often be the consequence of natural ferocity; but it is a habit frequently acquired from the foolish and teasing play of grooms and stable-boys. When a horse is tickled and pinched by thoughtless and mischievous youths, he will first pretend to bite his tormentors. By degrees he will proceed farther, and actually bite them; and very soon after that, he will be the first to challenge to the combat, and, without provocation, seize some opportunity to gripe the incautious groom; and then, as the love of mischief is a propensity too easily acquired, this war which commenced half playful and half in earnest, will become habitual to him, and will degenerate into absolute viciousness. Nothing can here be done in the way of cure. Kindness would aggravate the evil, and no degree of severity will correct it. Prevention is in the power of every proprietor of horses. While he insists on gentle and humane treatment of his animals, he should systematically forbid this horse-play. It is that which can never be considered as operating as a reward, and thereby rendering the animal tractable; nor does it increase the affection of the beast for his groom, because he is annoyed and irritated by being thus incessantly teased.

Kicking, as a vice, is another consequence of the culpable habit of teasing the horse. There is no cure for this vice; and the owner of kicking horses cannot be justified in keeping them. "I have seen," says Professor Stewart, in his *Stable Economy*, "biters punished until

they trembled in every joint, and were ready to drop, but have never, in any case, known them cured by this treatment, if by any other. The lash is forgotten in an hour, and the horse is as ready and determined to repeat the offence as before. He appears unable to resist the temptation; and, in its worst form, biting is a species of insanity." The system of Mr. Rarey, however, might be tried. Some acquire a habit of kicking at the stall, and particularly at night, from mere irritability and fidgetiness. This is productive of considerable inconvenience, as disturbing the other animals; and frequently the kicker does himself some injury. Mares are more subject to these freaks than horses. This is a habit very difficult to correct. We have seen it attempted by fastening a thorn-bush, or a piece of furze against the partition or post. When the horse finds himself pricked by the bushes, it has a tendency to prevent his kicking, and perhaps, in the end, may cure him of this very disagreeable and dangerous habit. Should this method, however, fail, recourse is had to the log, though the legs are often not a little bruised by it. A rather long and heavy piece of wood, attached to a chain, is buckled above the hock, so as to reach about half-way down the leg. When the horse attempts to kick violently, his leg will receive a severe rap from the log, and the repetition of the blow may induce him to be quiet.

Kicking in harness, however, is a much more serious vice, and those horses that are so fidgety in the stable are the most apt to do this. From the least annoyance about the rump or quarters, some horses will kick most violently, and destroy everything within their reach. Cautions may certainly be used. If the shafts are very strong and without flaw, or if they are plated with iron underneath, and a stout kicking-strap used, which will barely allow the animal the proper use of his hind limbs in progression, but not permit him to raise them sufficiently for the purpose of kicking, he may be prevented from doing mischief. Still there may be possibility of accident; the strap may break, and extreme danger may ensue. A horse that has once begun to kick, whatever may have been the original cause of it, can never be depended on again; and he will be very unwise who ventures to sit behind him. For this vice Mr. Rarey's system has proved a thorough remedy.

Restiveness on being Mounted.—When the difficulty of mounting arises not from eagerness to start, but from unwillingness to be ridden, the sooner such a horse is disposed of the better. He may be conquered by a determined rider, but a skilful horseman alone will manage him; and even he will not succeed without many and even dangerous contests. In the frequent strapping up of the near fore leg, however, a remedy has been found for this vice.—Mr. Rarey's system is here again recommended as a complete specific.

REARING

Sometimes proceeds from mere playfulness, carried to an unpleasant and dangerous extent; but it is oftener a vice, and consists in a desperate effort to unseat the rider. Sometimes it may be the result of using a deep curb and sharp bit. Some of the best horses will contend against this curb; and if the rearing proceeds from this cause, it may be prevented by using a snaffle bridle. It is otherwise a vice of such a dangerous description, that no rational man would think of mounting a horse addicted to it a second time.

The horse-breaker's remedy of pulling him backward on a soft piece of ground, is not only a dangerous, but a brutal one. Many animals have been injured in the spine, and others have broken their necks, by being thus suddenly brought over; while even the horse-breaker, who fears no danger, is not always able to extricate himself from the falling horse. Some animals, however, will be thoroughly tamed by a persevering system of soothing lessons, in which the voice of the trainer must be made familiar to him. He will then desist from his habit, and cease to rear the moment he is spoken to.

RUNNING AWAY.

Some headstrong horses will occasionally endeavour to bolt with the best riders. Others, with their wonted sagacity, will endeavour to dislodge the timid or unskilful. Some are hard to hold, or bolt only during the excitement of the chase; others will run away, prompted by a vicious propensity alone. There is no cure for this. The method which

affords any probability of success, is to ride with a strong curb and sharp bit; to have the horse always firmly in hand; and, if he will run away, and the place will admit of it, to give him (sparing neither curb, whip, nor spur) a great deal more running than he likes. Thoroughly trained horses, however, have no habit of this kind.

VICIOUS TO CLEAN.

There are a great many horses quiet to ride that are very difficult to clean. The origin of this is, probably, some maltreatment. In young animals, the skin is very delicate. If they have been curried with a too sharp comb, or rubbed too hard with an uneven brush, the recollection of the torture they may have felt makes them impatient, and even vicious, during every succeeding operation of the kind. Many grooms, likewise, seem to delight in producing these exhibitions of uneasiness and vice; although when they are carried a little too far, and endanger the limbs of the grooms, the animals that have been almost aggravated into these exhibitions of irritation are brutally kicked and punished.

This, however, is a vice which may be conquered. If the animal is dressed with a light hand, and whisped rather than brushed, and the places where the skin is most sensitive are avoided as much as thorough cleanliness will allow, he will gradually lose the recollection of former ill-treatment, and may become tractable and quiet to be cleaned. Strapping up the fore leg is a plan now adopted for the cure of this vice.

VICIOUS TO SHOE.

Nothing can be more annoying to a traveller than having a horse of this description. Meeting with an accident on the road, which demands the attention of the smith, this functionary is applied to, and, necessarily, dislikes the job as much as the traveller would himself. In nine cases out of ten, this vice has been caused by want of patience, and by injudicious management at the commencement of the shoeing of the horse; and it is, in reality, a very serious vice. It not only exposes the animal to occasionally severe injury from his own struggles, but also from the correction of the irritated smith, whose limbs, and even life being in jeopardy, is sometimes a little too heavy-handed in his mode of correction. Such a horse is very liable, and without any fault of the smith, to be pricked and lamed in shoeing; and if the habit should be confirmed, and it becomes necessary to cast him, or put him in the trevis, the owner may be assured that no long time will elapse before some formidable and even fatal accident will take place. If, therefore, mild treatment will not correct the vice, the animal cannot be got rid of too soon. "Horses, however, that have been vicious for a lifetime, are rendered quiet to shoe in one, two, or three lessons of taming. Indeed, upon the first instance of being thrown down, and thoroughly handled while in the horizontal position, the smith can shoe them with the greatest ease."

Horses have many unpleasant habits in the stable and on the road, which cannot be said to amount to vice, but which materially lessen their value.

CRIB-BITING.

The only remedy for this vice is a muzzle, with bars across the bottom, wide enough to enable the animal to eat his corn and pull his hay, but not to grasp the edge of the manger. If this be worn a very long time, the horse may, possibly, forget the habit; but, in the majority of cases, the desire returns with the power of gratifying it.

Most of the other bad habits and vices of the horse, have been remarked upon in their appropriate places in previous portions of this work.

This is the proper place to notice Dr. Bunting's patent break for harness horses, which is, perhaps, the most complete invention that has yet been made public for the purpose of subduing vicious horses, and the training of colts. "The principle," says the editor of *The Horse*, "is the same as that in the old thrashing machine, in which horses are placed between poles from a centre, and driven round in a circle. Dr. B. has improved upon the machine by the addition of a cart, or carriage, which is fixed to the end of each pole, &c., having strong bars of wood, of about fourteen feet in length, placed at their extremities. These bars are made 'to be' movable, to admit the horse between them; and to these bars the

horse is strapped with strong straps above and below. The driver sits upon one of the poles, and, with strong driving reins attached to the horse, and a good whip, he can break in one or more horses with the utmost ease. Dr. Bunting's plan, in combination with that of Mr. Rarey, will meet every case of restiveness that can enter into the perverse disposition of any horse, because it combines the several systems of coursing, driving, and, if necessary, riding also, at one and the same time, by the addition of a stable-leg in the saddle, provided the leg be furnished with post-boy's leather guards to protect the limbs from being crushed against the poles, without the possibility of danger or mischief to the animal through plunging, rearing, or kicking; since the weight of the wheels, and the strength of the apparatus, will immediately exhaust his strength for evil, and prevent that last resource of vice, the throwing down of himself. By these means any description of horse can be broken-in with the utmost facility, and with much greater quickness than has ever yet been attained. The slug can be roused, the impetuous restrained, and the kicker and the biter will soon be convinced of the uselessness of their utmost efforts. This apparatus can be made to hold several horses at the same time. A common capstan-head, to move backwards as well as forwards, will answer the purpose. Dr. Bunting has found that poles, of seven yards in length, are the most appropriate for the machine, since longer poles would be too elastic, and shorter ones would too much circumscribe the size of the circle."

CHAPTER XXXVIII.

WEIGHTS, MEASURES, AND MEDICINES, EMPLOYED IN THE TREATMENT OF THE DISEASES OF THE HORSE.

WEIGHTS AND MEASURES.

THE weights and measures used in the compounding of medicines, are troy weight and wine measure, which are divided and characterised as shown in the subjoined tables.

Troy Weight.

The Pound (lb.) contains	12 ounces	℥	xij
" Ounce . . .	8 drachms	ʒ	viij
" Drachm . . .	3 scruples	℈	iij
" Scruple . . .	20 grains	gr.	xx

Wine Measure.

The Gallon (longum) contains	8 pints		viij
" Pint . . .	16 fluid ounces	fl ℥	xvj
" Fluid ounce .	8 fluid drachms	fl ʒ	viij
" Fluid drachm .	60 minims . .	♏	lx

ACACIÆ GUMMI—*Gum-arabic.*

Gum is a thick, transparent, tasteless fluid, which exudes from certain species of trees, and is adhesive, and gradually hardens without losing its transparency. It is chiefly obtained from different species of the mimosa, particularly *M. Nilotica*, a native of Egypt and Arabia, whence it takes the name of gum-arabic. Its specific gravity is about 1·4. It is not changed by exposure to the air, but is deprived of its colour by the action of the sun. By heat it becomes soft, and is speedily reduced to the state of charcoal, which enters largely into its composition. Its constituent parts are carbon, hydrogen, and oxygen, with smaller proportions of nitrogen and lime. The oxygen is much less in quantity than the saccharine matter.

Gum readily dissolves in water; and the solution, which is thick and adhesive, is known by the name of mucilage. It is soluble also in the vegetable acids. Sulphuric acid decomposes it, and converts it into water, acetic acid, and charcoal. With the assistance of heat, muriatic acid and nitric acid produce a similar effect. It is insoluble in alcohol and ether. Such are the chief properties of gum-arabic, which is gathered in July and August.

Medicinal Uses.—Mucilaginous, chiefly used to form a vesicle for the exhibition of active

remedies; one to two ounces being dissolved in about a pint and a-half of water.

ACIDUM ACETICUM—*Acetic Acid—Vinegar.*

Vinegar is a liquid of a reddish or yellowish colour, having a pleasant sour taste, and an agreeable odour. Its specific gravity varies from 1·0135 to 10·251; and it differs also in its other properties, according to the liquid form in which it has been procured. It is very subject to decomposition; but Scheele discovered, that if it is made to boil for a few moments, it may be kept afterwards for a long time without alteration. Besides acetic acid and water, vinegar contains several other ingredients, such as mucilage, tartar, a colouring matter, and often also two or more vegetable acids. When distilled at a temperature not exceeding that of boiling-water, till about two-thirds of it have passed over, all these impurities are left behind, and the product is pure acid diluted with water.

Medicinal Uses.—Very useful in sprains or bruises. Equal parts of boiling-water and cold vinegar form a good fomentation. Extract of lead or baysalt may be added with advantage. As an inward remedial agent vinegar is rarely used, except in large doses, and even then it has very little power.

ACIDUM ARSENIOSUM—*Arsenic.*

As some veterinarians still continue to use this mineral as a tonic, we introduce it here. In the metallic state it is of a bluish-white colour, subject to tarnish, and to become first yellowish, then black, by exposure to air. It is brittle, and, when broken, exhibits a laminated texture. Its specific gravity is 5·763. In close vessels it sublimes entire at 356° Fahr., but burns with a small flame, if respirable air be present.

Medicinal Uses.—As a tonic, of from ten to twenty grains daily; but it is not a safe medicine. It is used also to cure ulcers. But there are both better tonics and safer caustics to be found.

ACIDUM MURIATICUM—*Muriatic Acid—Spirit of Salts.*

When equal volumes of hydrogen and chlorine gases are mixed and exposed to light, they combine and produce a sour compound, commonly called muriatic acid gas, or, in conformity to more modern nomenclature, hydrochloric acid gas. Muriatic acid may also readily be procured by acting upon common salt with sulphuric acid; the evolved gas must be received over mercury. It was first obtained pure by Dr. Priestley, but its composition was discovered by Scheele, and afterwards most ably investigated by Davy. Muriatic acid gas extinguishes flame; is readily absorbed by water, which takes up 480 times its bulk, and has a specific gravity increase from 1· to 1·210. Thus dissolved in water, it forms the liquid muriatic acid or spirits of salts; and may easily be procured by distilling a mixture of dilute sulphuric acid and common salt, as directed in the London Pharmacopœia. The marine acid in commerce has a straw colour; but this is owing to accidental impurity; for it does not obtain in the acid produced by the impregnation of water with the aëriform acid. The muriatic acid is one of those longest known, and some of its compounds are among those salts with which we are most familiar. It should be kept in stoppered bottles, and the proof of its goodness is in its weight.

Medicinal Uses.—Caustic applied externally, and the best we have in every case where a caustic is required. It is most commonly used as a solvent for oxymuriate of mercury, in the liquor *hydrargyris oxymuriates.*

ACIDUM NITRICUM—*Nitric Acid—Aqua Fortis*

The two principal constituent parts of our atmosphere—oxygen and nitrogen gases—when in certain proportions, are capable, under particular circumstances, of combining chemically into one of the most powerful acids—the nitric. If these gases be mixed in a proper proportion in a glass tube about a line in diameter, over mercury, and a series of electric shocks be passed through them for some hours, they will form nitric acid; or, if a solution of potash be present with them, nitrate of potash will be obtained. The constitution of this acid may be further proved, analytically, by driving it through a red-hot porcelain tube, as thus it will be decomposed into oxygen and nitrogen gases. For all practical purposes, however, the nitric acid is obtained from nitrate

of potash, from which it is expelled by sulphuric acid.

Take Dried Nitrate of Potash . 2 lbs.
„ Sulphuric Acid (by weight) 2 „

Mix them in a glass retort; distil the nitric acid off by means of a sand bath, till a red vapour arises; then having added another ounce of the dried nitrate of potash, continue the distillation. When these are heated together, a double decomposition takes place. The dry sulphuric acid unites to the potash, and forms sulphate of potash of what remains in the retort; whilst the nitric acid disengaged, unites with the water, rising in the state of vapour: these become condensed in the receiver, and form liquid nitric acid.

Medicinal Uses.—Caustic and stimulant; as the former, it is applied alone; as the latter, in combination with tar. It destroys all fungous excrescences by deadening them, and making them slough off.

ACIDUM HYDROCIANICUM—*Prussic Acid.*

Prussic acid, in chemistry and the arts, is one of the most important of the acids. It was discovered by accident about the beginning of the last century, by Diesbach, a chemist of Berlin. This gentleman, wishing to precipitate a decoction of cochineal with an alkali, got some potash on which he had distilled several times his animal oil; and as there was some sulphate of iron in the decoction, the liquor instantly exhibited a beautiful blue in the place of a red precipitate. Hence he saw the method of producing the same substance at pleasure; and it soon became an object of commerce, and obtained the name of Prussian blue, from the place where it was discovered. This substance is now formed, chiefly, during the decomposition of animal substances in high temperatures. In a concentrated state it is a deadly poison, and a few drops of it will kill a large animal.

Medicinal Uses.—A powerful sedative, and admirable in allaying the excitement of the nervous system. "In doses of six drops," says Mr. Yonatt, "largely diluted, it abates both pulmonary and gastric irritation. It may be worth trying in the form of enema, in cases of *tetanus*. It may also be given by the mouth in the same disease. The author of this work was the first who applied the hydrocyanic acid, for the purpose of allaying irritation of the skin in dogs. It seldom fails of producing the desired effect, and is similarly effective in subduing itchiness and mange in the horse."

ACIDUM SULPHURICUM—*Sulphuric Acid—Oil of Vitriol.*

Sulphuric acid is generally procured by burning a mixture of sulphur and nitre in chambers lined with lead. The sulphur burning in the atmospheric air of the chamber, forms sulphuric acid gas. The nitre gives rise to the nitric oxide, which, with the oxygen of the air, produces nitrous acid gas. These two gases, from the moisture present, form a white solid, which is instantly decomposed in the water, when the nitrous acid reverts to the state of nitre oxide, having transferred one additional proportion of oxygen to the sulphureous acid, forming sulphuric acid, which uniting with the water, forms liquid sulphuric acid. It is a liquid somewhat of an oily consistence, transparent and colourless as water, without any smell, and of a very strong acid taste. When applied to animal or vegetable substances, it very soon destroys their texture.

Medicinal Uses.—Caustic and stimulative, applied externally, but not very often used alone, entering more into combinations.

ALUMINÆ ET POTASSÆ SUPER SULPHAS—*Super Sulphate of Alum and Potash.*

This is a salt of alum. Potash and sulphuric acid are found native in some places; but the greater quantity of the alum used in commerce is prepared from alum ores. By exposing these to atmospheric air, the oxygen unites to the sulphur of the sulphuret of iron present, and becomes converted into sulphuric acid, and then combining with the alumine, the alum effloresces. This is subsequently evaporated, and then set aside to crystallise.

Medicinal Uses.—Astringent; this is only used for the horse as an external application in the formula.

ACONITI FOLIA—*Leaf of Aconite, or Monk's Hood.*

This is a perennial plant, cultivated in our gardens, flowering in June, but found native

in the mountainous parts of Germany. It should be gathered when the flowers appear.

Medicinal Uses.—This, like all the other narcotics used by the human subject, produces no such effect in the horse. In doses of one and a-half to two drachms, repeatedly given, it will produce efforts to vomit, accompanied with much general irritation.

ADEPS—*Hog's Lard.*

Medicinal Uses.—Emollient, and used for the formation of ointment.

ALCOHOL—*Rectified Spirits.*

This spirit is sometimes given to revive a horse that is sinking from extraordinary exertion; but it must, indeed, be an extraordinary occasion when we would recommend its use.

ALOES CABALLINA—*Horse Aloes are Cape Aloes.*

ALOE SPICATA—*Spiked, or Socotrine Aloes.*

ALOE VULGARIS EXTRACTUM—*Common, or Barbadoes Aloes.*

The general nature of these three kinds of aloes is nearly the same, the difference being only in the different proportions of the extracted gummy matter compared with the resinous. The smell and taste reside principally in the extracted matter as to their virtues, the resin being nearly inert.

The leaves of the plant are cut off, expressed, and the juice evaporated in the sun till of a fit consistence, which is then put into packages.

True Socotrine aloes are very scarce. They are brought to this country wrapped in skins, from the island of Socotra. Such as are now sold for Socotrine, is the produce of the spiked aloe of the Cape of Good Hope.

The term Caballina, applied to the Cape aloes, is for the sake of distinction, although it is believed that the same plant yields this, and what is now sold as Socotrine, differing only in quality. Cape aloes are imported in chests of two to four hundred pounds' weight each, enveloped in buffalo hides. The finest Barbadoes are brought in gourds, or calabashes, from the island of the same name, and contain from twenty to fifty-six pounds each. An inferior quality comes in casks.

Medicinal Uses.—Purgative and alterative; the first in doses of four to eight drachms, the latter in doses of one to three drachms. The effect of Cape aloes seems equal to any of the others.

AMMONIÆ MURIAS—*Muriate of Ammonia, Sal Ammoniac.*

A saline concrete, formed by the union of muriatic acid with ammonia. It is obtained from several sources. First, found native; second, prepared from camels' dung; third, which is the principal, from soot, bones, animal matter, known to contain the volatile alkali, as horn, &c. The process is as follows. The animal matter is placed in an iron cylindrical still, to which is attached a leaden receiver, cooled by a refrigeratory, which is its cover, and contains about four inches in depth of water; heat being applied, distillation is allowed to go on. The oil which rises to the surface of the distilled liquor being removed, to the residue—which is impure alkaline solution—is added sulphuric acid, and a sulphate of ammonia is formed; to this is added common salt, when a double decomposition takes place, muriate of ammonia, and sulphate of soda, being formed through chemical agency. These being in solution, the last salt is crystallised, and the first sublimes into cakes.

Medicinal Uses.—Refrigerant, applied externally, dissolved in vinegar, in inflammatory swellings, when cold is the required object. It is now used internally, but it hardly merits a notice here.

[It may not be irrelevant to observe, that a solution of any neutral salt in water, lowers the temperature of it by robbing it of a portion of its caloric, to liquefy the salt; but the solution will acquire a mean of temperature equal to the surrounding medium in which it is placed, in the course of time, therefore it should be used as soon as made].

ANTHEMIS—*Camomile.*

Medicinal Uses.—This is the mildest tonic in veterinary practice. It is given in doses of one or two drachms, to ascertain whether the febrile stage of the disease has passed away, and to suggest the administration of gentian, which is a more powerful tonic, and is frequently given to the horse.

ANTIMONII SULPHURETUM—*Sulphate of Antimony.*

Medicinal Uses.—Alterative and vermifuge; but of very little effect. Much used amongst grooms, combined with sulphur and nitrate of potash. Dose from half an ounce to one ounce.

ANTIMONII TARTARIZATUM—*Tartarised Antimony—Emetic Tartar.*

Medicinal Uses.—Febrifuge in doses of half a drachm to two drachms, generally in combination with nitre, &c. Large doses will not, in the horse, produce nausea, even to the quantity of an ounce.

ANCHUSÆ RADIX—*Alkanet Root.*

The root of a perennial plant, growing in the south of Europe.

Medicinal Uses.—Merely used for the sake of its colouring matter, which it readily yields to oils, fats, spirits, &c.; but not to water.

ARGENTI NITRAS—*Nitrate of Silver—Lunar Caustic.*

Lunar caustic is the old name for nitrate of silver, melted and cast into cylindrical pieces about the size of small black-lead pencils, for the use of surgeons.

Take Silver	1	oz.
„ Nitric Acid	1	fl „
„ Distilled Water	2	fl „

Mix the nitric acid with the water, and dissolve the silver with the mixture on a sand-bath; then gradually raise the heat until the nitrate of silver becomes dry; melt this in a crucible over a slow fire until ebullition ceases; then pour into moulds.

Decomposition.—Nitric acid is composed of oxygen and azote; and when the silver is dissolved, a portion of the acid is decomposed, its azote escaping into the air with the oxygen, which forms with it fumes of red nitrous acid gas. The oxygen of the decomposed acid unites with the silver to form into an oxide, whilst the undecomposed acid dissolves, and converts it into nitrate of silver.

Medicinal Uses.—Caustic. This appears to have given place to less expensive preparations, such as the nitric acid, and the sulphate of copper. It is, however, much to be preferred to the hot iron, or to any acid, for destroying the part in the horse, bitten by a mad dog. Next to the butyr of antimony, it is the best application for the removal of fungus excrescences.

BOLUS ARMENIÆ—*Armenian Bole.*

In mineralogy, bole is a mineral, found chiefly in Italy, Silesia, and the isle of Lemnos. It is generally of a dusky yellow or brown colour, of an earthy texture, and acquires a polish by friction. It has a greasy feel, and adheres strongly to the tongue. On being put into water it absorbs a little, and breaks into small fragments with a crackling noise.

Medicinal Uses.—Slightly astringent and absorbent. It is chiefly used for colouring ointments and powders, and for lowering the effect of other active remedies, as sulphate of copper and alum, when used as astringent powders, in case of grease, &c., &c.

CAMPHORÆ—*Camphor.*

This concrete juice is extracted from the wood of the *laurus camphora.* Pure camphor is white and pellucid, unctuous, of a bitterish aromatic taste, and of a fragrant smell. It is extremely volatile and combustible.

The roots of zedoary, thyme, rosemary, sage, the *linula hellenium*, the anemone, the pasque flower, or *pulsa tilla*, and other vegetables, give camphor by distillation. It is observable, that all these plants afford a much larger quantity of camphor when the sap has been suffered to pass to the concrete state by several months' drying. Thyme and peppermint, slowly dried, yield much camphor; but the roots and branches of the camphor tree are its most natural produce.

Camphor is not soluble in water in any perceptible degree, though it communicates its smell to that fluid, and may be burned as it floats on its surface. Alcohol, ethers, and oils, dissolve it.

The addition of water to the spirituous or acid solutions of camphor instantly separates it.

Camphor has long been a valuable article in the *materia medica*, being one of the most efficacious diaphoretics, and much esteemed for its use in malignant fevers and epidemical diseases. Camphoric acid is the result of the change effected on camphor by repeatedly distilling nitric acid from it.

It forms a variety of salts called camphorates.

Medicinal Uses.—Febrifuge, internally; stimulant, externally; in doses of one drachm to two drachms, combined with nitre and tartarised antimony. As an external application it is used in the compound soap liniment. Mixed with opium, it is now used by Mr. W. Spooner in cases of locked-jaw. The doses are from one to two drachms. Professor Morton considers it a narcotic. Combined with oil of turpentine, it is effective in relieving stiff joints after labour.

Cantharis—*Blistering Fly.*

Cantharides, or blistering flies, in the *Materia Medica*, are insects used to raise blisters, and differ in their size, shape, and colour. The largest are about an inch long. Some are of a pure azure colour; others of that of pure gold; and others, again, have a mixture of gold and azure colours, all brilliant and extremely beautiful. They are more common in hot countries, though they are occasionally to be met with in all parts of Europe, at some seasons of the year; particularly among wheat and on meadows, upon the leaves of the ash, the poplar, the willow, &c. They abound in Spain, Italy, and France, on several kinds of trees. Those from Spain are obtained by shaking the trees on which they are found, and catching them in a cloth spread underneath. They are then killed by the steam of boiled vinegar, and dried by the sun or stove. The active principle appears to reside in an oil which they contain.

Medicinal Uses.—Vesicant, applied in the *formulæ unguentum cantharidis infusium*, &c. Recently the application of this fly has come into more general use. Combined with vegetable bitters, it is recommended as a stimulating tonic in cases of debility. It has also been applied to the curing of glanders. The dose is from five to eight grains, given daily; but when diuresis supervenes, it must not be used for a day or two.

Capsici Baccæ—*Capsicum Berries.*

Capsicum, or Guinea pepper, is the fruit of a berry. There are five species, the principal of which are—1. *Capsicum annum*, the common long-podded *capsicum*, which is cultivated in our gardens. Of this there is one variety with red, and another with yellow fruit.—2. *Capsicum baccatum*, bird pepper, rising with a shrubby stalk, four or five feet high; the fruit grows at the division of the branches, standing erect; these are small, oval, and of a bright red, and form what is called Cayenne pepper.—3. *Capsicum grossum*, the bill pepper. The fruit of this is red, and is the only kind fit for pickling.

Medicinal Uses.—Valuable as stimulants, and highly to be recommended in cases of cold. The dose is from a scruple to half a drachm.

Carui Semina—*Caraway Seeds.*

These alone, or in a state of combination with ginger, are the best stimulants used in veterinary practice.

Catechu Extractum—*Extract of Catechu—Catechu.*

Catechu is a brown astringent substance formerly known by the name of Japan earth. It is a dry extract, prepared from the wood of a species of sensitive plant, the *mimosa catechu.* It is imported from the East Indies. As a medicine it has been recommended as a powerful astringent, and a tincture of it is used for this purpose; but its aqueous solution is less irritating. Made into troches, with gum-arabic and sugar, it is an excellent preparation; and in this way is said much to assist the clearness of the voice, and to be remarkably serviceable in disorders of the throat.

Medicinal Uses.—Astringent. Dose from two drachms to four drachms, in combination with *creta preparata.* For wounds it is an excellent application, and with aloes quickens their healing wonderfully.

Creta Preparata—*Prepared Chalk.*

Chalk is a white, dry, calcareous earth. Where it is found at all, it is the preponderating substance, and may, therefore, be considered as characterising a peculiar species of mineral formation. It occurs in strata for the most part nearly horizontal, alternating with thin layers of flint nodules, and with the same irregularly dispersed through its substance. It contains in abundance the relics of marine organised bodies, such as *echinites*,

glossopetræ, pectinites, &c., and also, not unfrequently, the hard parts of amphibious and land animals, as the heads and vertebræ of crocodiles, and the teeth of elephants. Its uses are very extensive. The more compact kinds are used as building stone, and are burnt to lime; nearly all the buildings in London being cemented with chalk-mortar. It is also largely employed in the polishing of metals and glass; in constructing moulds to cast metal in; by carpenters and others as a material to mark with; and by starch-makers and chemists to dry precipitates on, for which it is peculiarly qualified on account of the remarkable facility with which it absorbs water.

Prepared chalk is made by washing common chalk in water, and allowing the grosser particles, as sand, &c., to fall to the bottom; whilst the firm particles floating on the water, are poured off with it into another vessel, and then permitted to subside, and are afterwards made into nobs, and dried.

Medicinal Uses.—Absorbent, anti-acid. It is either given alone, or in combination with kino, catechu, &c., in quantities of from four ounces to six ounces in diarrhœa. To ulcers that discharge a thin and ichorous matter it is successfully applied.

Copaiba—*Balsam Capivi.*

Copaiba, or *balsam of capivi*, is a liquid resinous juice which comes from the trunk of the *copaifera balsamum*. It is distilled in water, and yields a quantity of limpid essential oil.

Medicinal Uses.—Diuretic; but, from its expensiveness, it is little used, as its properties are little different from those of other diuretics.

Crotoni Semina—*Croton Seeds.*

The Croton-nut has only recently been introduced into veterinary practice, although, as a very strong purgative, it has been used in India from time immemorial. There are many species of the plant which produce the seeds, the principal of which are:—1. The *tinctorium*, which grows naturally in the south of France, and from which is made the turnsole used for colouring wines and jellies. This is made of the juice lodged between the empalement and the seeds; and if rubbed on cloths, at first appears green, but soon changes to a purple. If these cloths are put into water they will dye it of a claret colour. The rags thus dyed are brought to this country, and sold under the name of turnsole.—2. The *seviferum*, or tallow tree, is about the height of the cherry tree; the leaves are heart-shaped, and of a deep red colour. The fruit is enclosed in a cover like the chestnut; and consists of three white grains, each having a capsule, and within that a stone. This stone is surrounded with a white pulp, which is not the tallow; for that is expressed from the kernels, and the Chinese make their candles of it.—3. The *aromaticum*, with heart-shaped serrated leaves, and an arborescent stem. The bark of this tree is the same with the *cascarilla* and *eleutheria*. It is a strong bitter, and has been used in intermittent fevers in preference to the Peruvian bark.—4. The *cascarilla* described by Dr. Wright, is the wild rosemary shrub of Jamaica; but its bark has none of the qualities with the preceding.—5. The *Tigleum;* one drop applied to the tongue acts as a powerful cathartic. This is the one that is used in horse-practice.

Medicinal Uses.—Cathartic, in doses, from ten to thirty grains in a ball. It appears from experiment from the meal, or rather cake, which remains in the press after the expression of the oil from the seeds, that the active principle does not reside so much in the oil as in a peculiar resin. Its effects are rather uncertain. On account of the rapidity of its operative power, it is given in staggers and locked-jaw. From twenty to forty drops put on the tongue of a horse produces purging; but the membrane of the mouth is often violently inflamed by it.

Cupri Subacetatis. Ærugo—*Subacetate of Copper—Verdigris.*

Verdigris is principally made in the south of France, by putting plates of copper among the residuum of the grape, after the expression of its juice. By frequently sprinkling them with water, and allowing the grape-stalks to ferment, a thick coating of verdigris is formed on the surface of each plate, and is scraped off by means of a knife, then put into bags, and exposed to the sun and air to dry.

Medicinal Uses.—Detergent and escariotic. It has been administered internally, but it is

a dangerous medicine. Externally it forms a mild caustic. When boiled with vinegar and honey, it makes the *Egyptiacum* of the farriers, which is good in ulcerated mouth, but not so good as some other remedies.

Cupri Sulphas—*Sulphate of Copper—Blue Vitriol.*

This is produced by the union of sulphuric acid and copper. It is also procured by washing copper pyrites, and exposing them to the action of air and moisture. When required for these purposes, it may be made in the same manner as sulphate of zinc, by putting pieces of copper into diluted sulphuric acid, contained in a glass vessel, and when the effervescence has ceased, filtering the solution through paper, and boiling it down till a pellicle appears on the surface; then setting it aside that crystals may form, which are to be dried in bibulous paper.

Decomposition.—Concentrated, it does not act on the metals at the ordinary temperature of the atmosphere. These require to be diluted when action goes on rapidly; the water is decomposed, its oxygen unites to the copper, and converts it into an oxide, which is dissolved by the sulphuric acid, and forms sulphate of copper, whilst its hydrogen escapes in the form of gas.

Medicinal Uses.—Tonic, internally; stimulant and escharotic externally, given in doses of from one to two drachms, combined with ginger, as a general tonic, in the form of balls; but when given, in cases of glanders and farcy, in doses of from four to eight drachms, it is advisable to make it into a draught, by dissolving it in about two pints of water, and adding an ounce of linseed meal to the solution. Its value in these diseases, however, is almost entirely considered to have ceased. Externally, it is applied either in solution or in powder. When applied in solution, it is in the proportion of two drachms to a pint, when it acts as a gentle stimulant. An ounce dissolved in the same quantity converts it into a mild caustic. For canker in the foot, the blue vitriol is a good application.

Digitalis Folia—*Fox-Glove Leaf, or Digitalis.*

Of the *digitalis*, or *fox-glove*, there are several species, five of which are herbaceous, biennial, and perennial plants. The herbaceous species rise two or three feet high, crowned with spikes of yellow, iron-coloured, or purple flowers. The *canariensis*, or shrubby sort, rises five or six feet high, having spear-shaped rough leaves, the branches being terminated with flowers growing in loose spikes. All the species are easily raised by seeds. An ointment made of the flowers of purple fox-glove and fresh butter, is commended by some surgeons for scrofulous ulcers. Taken internally, the plant is a purgative and emetic; and is, therefore, only to be administered to robust constitutions. An infusion of two drachms of the leaf in a pint of water, given in half-ounce doses, every two hours, till it causes vomiting or purging, is recommended in dropsy, particularly that of the breast. The leaves are the part of the plant used medicinally, which should be gathered just as the plant is in flower, and dried quickly in the shade; or, what is still better, secluded entirely from light. Let them be powdered, and kept in well-stopped bottles for use.

Medicinal Uses.—Sedative, given in doses of from half a drachm to two drachms, in the form of a ball. The effect of digitalis requires watching; although the over-dose will only lower the vital energies of the patient in cases of intermittent fever. In the form of tincture it is excellent for inflammation of the eyes; and as a sedative it is nearly equal to opium. An infusion of it has, also, been found serviceable in mange.

Extractum Belladonnæ—*Extract of Deadly Nightshade.*

This is prepared by bruising the leaves of the plant in a stone mortar, sprinkling a little water on them, and then pressing out the juice and evaporating. It must stand until it acquires a thick consistency.

Medicinal Uses.—Stimulant. It is only used as an application to the eye, to cure a morbid contraction of the iris, or rather its circular fibres, in quantities of from two to five grains.

Euphorbii Gummi Resini—*Euphorbium.*

The name of *resin* is used to denote solid inflammable substances, of vegetable origin,

soluble in alcohol, usually affording much soot by their combustion. They are likewise soluble in oils, but not at all in water, and are more or less acted on by the alkalies. All the resins appear to be nothing more than volatile oils, rendered concrete by their combination with oxygen. Analysed by MM. Gay Lussac and Thenard, resin was found to consist of

Carbon. .	.75·944	
Hydrogen.	.10·719	Water, 15·156.
Oxygen .	.13·373	Hydrogen in excess, 8·9.

The resin of fir is known by the name of rosin. Its properties are well known. Its specific gravity is 1072. It melts readily; burns with a yellow light, throwing off much smoke. Resin is insoluble in water, either hot or cold, but very soluble in alcohol.

The plant which yields euphorbium is perennial, succulent, and shrubby. It is obtained by making incisions in the branches, from which a lartious gum exudes, and concretes into drops.

Medicinal Uses.—Stimulant. Rubefacient. It is used externally, entering into the compound *unguentum cantharides*. Internally it is given as a diuretic, in doses of from five to six drachms, made into a ball, with soft soap. A preference, however, is given to the common liquid turpentine.

FERRI SULPHAS—*Sulphate of Iron—Copperas.*

Copperas is the green salt sulphate of iron; and the blue salt sulphate of copper is also sometimes called copperas.

Take of Iron (by weight)	. :	8 oz.
„ Sulphuric Acid	. . .	8 „
„ Water	. . . . .	4 „

Mix the sulphuric acid with the water, in a glass retort, and to this add the iron in the form of filings. When bubbles cease to escape, filter the solution through paper, and evaporate over a slow fire, so that, as it cools, crystals may form. Having poured off the supernatant fluid, dry the crystals upon bibulous paper.

GENTIANA—*Gentian.*

Of this plant there are many species. The most remarkable are the lutea, or common gentian, the root of which is an excellent stomachic bitter; and the lesser centaury.

Decomposition.—Water consists of oxygen and hydrogen, and a portion of it is decomposed by the action of the sulphuric acid and iron. Its oxygen unites to iron, converting it into an oxide of iron; before which the sulphuric acid will not act upon it, whilst its hydrogen being set free, escapes in the form of gas. The oxide of iron is then dissolved by the sulphuric acid, and sulphate of iron is formed.

Medicinal Uses.—Tonic; combined with ginger.—*Carbonate of Iron* is a mild tonic given in doses of from two to four drachms.—As a stomachic, and a tonic, gentian holds the highest place in veterinary practice. Four drachms of it, two of camomile, one of ginger, and one of carbonate of iron, make an admirable tonic ball. An application of an infusion of gentian to putrid ulcers is one of the best.

GLYCYRRHIZÆ RADIX—*Liquorice Root.*

The *glycyrrhiza*, or *common liquorice shrub*, has a long, thick, creeping root, striking several feet deep into the ground. It is an annual, with an upright, firm, herbaceous stalk, three or four feet high, garnished with winged leaves, of four or five pair of oval lobes, terminated by an odd one; and from the axillas, erect spikes of pale blue flowers in July, are succeeded by short, smooth pods. The root of this plant is the useful part, being replete with a sweet, balsamic, pectoral juice, which is either extracted, or the wood sold in substance. It is much used in all compositions for coughs, and disorders of the stomach; but by far the greatest quantity is used by brewers. The common liquorice is cultivated in most countries of Europe, for the sake of its root; but in Spain and Italy, and particularly in Sicily and Calabria, it makes a considerable article of commerce with this country. Liquorice also grows in great abundance in the Levant; and vast quantities of it are consumed there, in making a decoction which is drunk cold in the summer, in the manner of sherbet.

To prepare liquorice, the roots are boiled a long time in water, till the fluid acquires a deep yellow tincture; and the water at length evaporated till the remains assume consistency, when they are formed into sticks, which are packed up with bay leaves, in the same

order as received in England. The boiling requires the utmost care and precaution, as the juice takes an unpleasant smell and flavour, if burnt in the least degree. We introduce it here, not on account of any value it has in veterinary practice, but because, when dried and ground, it is used for adding to bulk, rather than for any other purpose.

Medicinal Uses.—Demulcent.

HYDRARGYRUM—*Quicksilver—Mercury.*

Mercury is a metal, which, in our climate, is always fluid, but in intense cold it becomes solid, and then resembles silver in appearance, and is malleable. It is sometimes found native, but much more frequently combined with sulphur, when it is denominated cinnabar. It is separated from the sulphur by distillation with quicklime, or iron filings. It is obtained abundantly in the Austrian territories, and in South America, and has a great affinity for other metals. One hundred pounds of the ore give about one hundred and three pounds of quicksilver.

Medicinal Uses.—Only employed for making mercurial preparations.

HYDRARGYRI OXYMURIATIS—*Oxymuriate of Mercury—Corrosive Sublimate.*

Take of Purified Mercury (by weight)	2	lb.
„ Sulphuric Acid	30	oz.
„ Dried Muriate of Soda . .	4	lb.

Boil the mercury with the sulphuric acid in a glass vessel, until the sulphate of mercury becomes dry. Rub this, when it is cold, with the muriate of soda, in an earthen mortar; then sublime in a glass, the heat being gradually raised.

Decomposition.—When sulphuric acid and purified mercury are boiled together, a portion of the acid is decomposed and separated into sulphurous acid oxygen; the former being dissipated in the gaseous state, the latter combines with the mercury, and converts it into peroxide; and this uniting with the undecomposed acid, a super-sulphate of peroxide, or bifer sulphate of mercury, is formed. To this the salt is added, when another decomposition takes place, as follows.

We consider salt as a compound of chlorate and sodium. This, when heated with the bifer sulphate of mercury, is decomposed by it; the sodium is converted into soda by its combination with the oxygen from the mercury which is dissolved by the sulphuric acid, and forms sulphate of soda; whilst the chlorine unites with the mercury, and forms peroxide or chloride of mercury.

Medicinal Uses.—Caustic, applied externally, either mixed with grease or in solution, as in the formula, liquor *hydrargyri oxymuriatis.*

IODINE.

Iodine has only recently been introduced into veterinary practice, but it has now obtained a high reputation. In the *Manual of Pharmacy*, by Professor Morton, the different combinations in which iodine may be used are described. Under the name of diniodide of copper, he describes it as an admirable tonic, if combined with vegteable tonics, and especially small doses of cantharides. This combination Professor Spooner and Mr. Davis have applied with decided success, to the alleviation of farcy, glanders, and nasal gleet.

HYDRARGYRI SUBMURIA—*Submuriate of Mercury—Calomel.*

Take of Purified Mercury (by weight)	4	lb.
Sulphuric Acid	30	oz.
Muriate of Soda	1½	lb.
Muriate of Ammonia	8	oz.

Boil 2lb. of the mercury with the sulphuric acid in a glass vessel, until the mercury formed is dry. When this is cold, triturate it with the other 2lb. of mercury in an earthen mortar; then add the muriate of soda, and rub them together, until globules are no longer visible. Afterwards reduce the sublimed matter to a very fine powder; pass it through a sieve, and mix it very carefully with the muriate of ammonia, previously dissolved in a gallon of boiling distilled water; set it by, that the powder may subside. Pour off the solution, and wash the powder frequently with boiling distilled water, until solution of ammonia drops, and throws down precipitate; lastly, let it be reduced to a very fine powder.

Decomposition.—It is the same as the preceding article, with only this difference; that one-half of the chlorine unites with the fresh portion of mercury added, so that the per or bi-chloride becomes converted into chloride, or

pro-chloride of mercury. The muriate of ammonia appears to be added for the purpose of dissolving any corrosive sublimate which may be formed with the calomel.

Medicinal Uses.—Anthelmiatic, or vermifuge and alterative; for these it is given, in doses of from one to two drachms, in the form of a ball, at night, and a dose of aloes in the morning. It is used in cases of surfeit, worms, or mange; also, sometimes, for chronic cough, farcy, and jaundice. Taken alone, it is only slightly purgative on the horse, and is given in doses of from a scruple to a drachm. In arresting the violence of epidemic catarrh, calomel has recently gained a high reputation.

Kino—*Kino.*

An extract, prepared from a non-descriptive African tree.

Medicinal Uses.—Astringent, given in doses of from two to four drachms, generally in combination with chalk.

Lime.

Lime is one of those earthy substances which exist in every part of the known world, and is found purest in limestone, marble, and chalk. None of these substances are lime, but are capable of becoming so by being burnt in a white heat.—It may be also obtained perfectly pure by burning calcareous spars, and also by burning some pure white marbles. It may be procured also in a state of purity by dissolving oyster-shells in muriatic acid. It has been ascertained by Sir H. Davy to consist of oxygen and a metallic basis, which he denominates calcium.

Lini Semina—*Linseed.*

The seed of the common flax, a well-known annual plant, which flowers in July; the seed ripens in September.

Medicinal Uses.—Demulcent, given in any quantity. Two ounces of the seed, boiled in two pints of water for a short time, will form an excellent jelly-like-fluid, for the administration of any of the sulphates. In cases of sore throat or catarrh, affections of the bowels or the urinary organs, an infusion of it is frequently given instead of water. Thin gruel, however, is to be preferred. As a poultice the meal answers almost for every purpose.

Myrrhæ—*Myrrh.*

Myrrh is a gum resin brought from the Levant and East Indies, and used in medicine. It is hard, dry, glossy, of a reddish-brown colour, with an admixture of yellow; transparent or opaque; of a peculiarly strong smell, and a bitter, somewhat biting taste. With water it forms a yellow opaque solution, and by distillation yields an essential oil. It is imported into this country in chests.

Medicinal Uses.—Stimulant, applied externally, in the form of tincture. United to the tincture of aloes it may be applied to wounds as a stimulative and digestive agent. Inwardly, however, it is of little use, although, when combined with opium, it is sometimes administered in cases of chronic cough.

Nicotiana—*Tobacco.*

Of this narcotic there are several kinds. English tobacco seldom grows to more than three feet in height, having smooth alternate leaves upon short foot-stalks; flowers in small loose bunches on the top of the stalks, of a yellow colour, appearing in July; which are succeeded by roundish capsules, ripening in the autumn. Sir Walter Raleigh, on his return from America, is said to have first introduced the smoking of tobacco into England. In a house in which he lived, at Islington, his arms are said still to be seen, with a tobacco plant on the top of the shield. It is remarkable that tobacco has prevailed over the original name, *petum*, in all the European languages, with very little variation, and even in Tartary and Japan. Tobacco is derived from the island of Tobago. Petum is the Brazilian name.

Medicinal Uses.—Limited; but, in the hands of a good practitioner, may be rendered serviceable in extreme cases of costiveness, or in dangerous colic. Let it never be used internally for the promotion of a fine coat, or as an external application for mange.

Oleum Olivæ—*Olive Oil.*

The olive tree is a native of the South of Europe, cultivated in great abundance in France and Spain. It seldom becomes large; but two or three stems frequently rise from the same root, from twenty to thirty feet in height, putting forth branches almost their whole

length, covered with a greyish bark. The oil is produced from the ripe fruit which is gathered in November, and immediately crushed in a mill, the stones of which are kept so wide as not to bruise the nut. The pulp is subjected to the pressing bags, made of rushes; and by means of gentle squeezing the best oil flows first. A second oil is yielded by breaking the mass, moistening it with warm water, and turning it to the press. A third, and still inferior sort, is obtained by boiling the residue, or by breaking, moistening, and fermenting it in large cisterns, and again submitting it to the full force of the press.

Medicinal Uses.—Aperient to an inconsiderable extent in the horse. Emollient. It may be given in the quantity of a pint. Over castor oil it possesses no advantage. It enters into the composition of liniments, &c.

Oleum Picis Liquidæ—*Oil of Tar.*

Take of Tar	5 lbs.
„ Water	4 pints.

Distil from a retort with great care. What remains in the retort is pitch.

Medicinal Uses.—Stimulant and irritant. This is only used as an external application, either alone, or combined with olive oil, as in the *Linimentum Picis Liquidæ.*

Oleum Sulphuratum—*Sulphurated Oil.*

Take of Washed Sulphur	2 oz.
„ Olive Oil	1 pint.

Heat the oil in a very large iron vessel, and add the sulphur by degrees to it; and keep constantly stirring them with a spatula, till they are combined. This is merely a solution of sulphur and oil.

Medicinal Uses.—Used, in the language of the laboratory, to kill the quicksilver in making the *Unguentum Hydrargyri Fortius.*

Oleum Terebinthina—*Oil of Turpentine.*

Take of Common Turpentine	5 lbs.
„ „ Water	4 oz.

Distil the oil from a copper alembic with great care. What remains in the retort is resin.

Medicinal Uses.—Diuretic; stimulant; given in doses of from two drachms to one ounce; this acts as a diuretic; but in doses of from four ounces to eight, it acts as a stimulant to the intestines in cases of gripes. Applied to the skin, it is a violent irritant; but combined with olive oil, it forms a useful embrocation.

Opium—*Opium.*

The white poppy, of which this is the produce, is a native of Asia; but is sometimes found growing wild in England. The market is principally supplied with opium from Turkey, though the poppy is cultivated in almost all states in Europe. To obtain opium, the half-ripe capsules have all, after sunset, longitudinal excisions made in them. The night dews favour the exudation of the juice, which is collected, in the morning, by means of a small iron scoop. It is then deposited in an earthen pot, where the whole is worked by the hand, in the sunshine, until it has acquired a considerable degree of spissitude. It is then formed into cakes, which are laid in basins to be further dried. Then they are covered with tobacco, or poppy leaves, and packed in chests, in which state they are imported to this country.

Medicinal Uses.—Producing but little effect on the horse; none as a narcotic; like the narcotic used by the human subject, generally acting as an irritant. It is, however, a powerful astringent, sedative, and anti-spasmodic. In the treatment of tetanus, or locked-jaw, it is greatly relied on in veterinarian practice. It should, however, at all times, be administered with caution. In cases of ophthalmia it is useful, applied externally. If, in instances where the cantharides, or blue vitriol, have been used to too great an extent, there is no drug equal to opium for quieting the disorder they may have occasioned. It is administered in the form of a ball, in doses of one or two drachms, according to circumstances; other medicines are generally combined with it.

Petroleum—*Barbadoes Tar.*

This variety of bitumen is collected from the surface of water, which exudes from the sides of hills, in which pits are sunk for its reception, and skimmed every week. It is the same as naphtha—now a well-known liquid in this country.

Medicinal Uses.—Stimulant. It is applied externally, but possesses no advantage over common tar.

Pix Nigra—*Black Pitch.*

This is the residue in the retort after the distillation of the oil from tar.

Medicinal Uses.—Slightly stimulant, and adhesive; but seldom used.

Pix Liquida—*Tar.*

This is obtained by placing billets of the Scotch fir in large stacks, which are closely covered with turf, and to which fire is then applied. They are suffered to burn with a slow, smothered flame; during which time tar is formed by the decomposition of the resinous juice of the wood, which flows to the bottom, and runs out at a small channel cut for the purpose.

Medicinal Uses.—Stimulant applied externally, entering into the composition of *Unguentum Picis Liquida.* Melted with an equal quantity of grease it makes the common stopping of the farrier, and is extremely useful for dressing bruised or wounded feet. Its chief value, however, in veterinary practice does not arise from its keeping out dirt and water from the wounded part, but from its mollifying influences on the horse itself, making the part more elastic, yet softer, and less likely to break away. It is the proper basis of thrush ointment, and is also used as an ingredient in the applications for mange. The spirit of tar, combined with double the quantity of fish oil, is one of the very best applications that can be made to hard and brittle feet. Tar is sometimes given in doses of two or three drachms, in cases of chronic cough.

Plumbi Oxydum Semivitium—*Semivitrified Oxide of Lead—Litharge.*

Lead is a white metal of a considerably blue tinge; very soft and flexible; not very tenacious. Its sp. gr. is 11·35. It melts at 612 deg.

This oxide of lead is prepared by the action of heat and air upon the metal. The lead is placed upon a warm furnace in a hollow dish made of ashes, and kept at a red heat with the blast of a large pair of bellows directed on its surface. An oxide soon appears, and is successively formed by raking it, and exposing it to a new surface.

All the oxides of lead are easily revived with heat and carbon. Oxygen and lead combine together in different proportions. If the nitrate of lead be dissolved in a precipitation produced by potash, the precipitate, when dried, will become the yellow protoxide. If it be somewhat vitrified, it constitutes litharge; and combined with carbonic acid, it becomes white lead, or ceruse. Lead, alloyed with an equal weight of tin, ceases to be acted upon by vinegar. Acetate and sub-acetate of lead have a good effect, as external applications, for inflamed surfaces, burns, scrofulous sores, and as eye-washes. Lead, taken internally, is very injurious; hence the diseases to which painters are liable. Litharge, dissolved in wines, to give them a sweet taste, is very mischievous. Sulphuretted hydrogen will cause it to throw down a black precipitate.

Medicinal Uses.—In making the liquor *plumbi superacetatis.* For the deleterious effects produced upon animals in the neighbourhood of lead works, active purgatives, followed by opium, are the most effective remedies

Plumbi Superacetatis—*Superacetate of Lead.*

Take of Carbonate of Lead . 1 lb.
„ Acetic Acid . . . 1½ gallon.

Boil the carbonate of lead with the acid until it is saturated, then filter it through paper, and evaporate it until a pellicle appears. Set it aside to crystallise from off the *super natant* born fluid, and dry the crystals on blotting-paper.

Medicinal Uses.—Cooling, applied externally in the form of solution, for inflammation of the eyes. Goulard's ointment, however, is a better preparation for external and superficial inflammation.

Potassæ Nitras—*Nitrate of Potash—Nitre.*

Nitre is the common name of the nitrate of potash. It is known by the name of saltpetre, and is found ready formed in the East Indies, in Spain, in the kingdom of Naples, and elsewhere, in considerable quantities; but nitrate of lime is still more abundant. Far the greater part of the nitrate made use of, is produced by a combination of circumstances which tend to compose and condense nitric acid. This acid appears to be produced in all situations where animal matters are completely decomposed through the action of air upon

substances with which it can readily combine. Grounds frequently trodden by cattle, and impregnated with their excrement, or the walls of inhabited places where putrid animal vapours abound, such as slaughter-houses, drains, or the like, afford nitre by long exposure to the air. Artificial nitre-beds are made by an attention to the circumstances in which this salt is produced by nature. The crystals of nitre are usually of the forms of six-sided flattened prisms, with dihedral summits. Its taste is penetrating; but the cold produced by placing the salt to dissolve in the mouth, is such as to predominate over the real taste at first. Seven parts of water dissolve two of nitre, at the temperature of sixty degrees; but boiling water dissolves its own weight. On being exposed to a gentle heat, nitre fuses; and in this state, being poured into moulds, so as to form little round cakes or balls, it is called *sal prunella*, or *crystal mineral*. The uses of nitre are various. Besides those already indicated, it enters into the composition of fluxes, and is extensively employed in metallurgy. It serves to promote the combustion of sulphur in fabricating its acid; it is used in the art of dyeing; it is added to common salt for preserving meat, to which it gives a red hue; it is an ingredient in some frigorific mixtures, and it is prescribed in medicine as cooling, febrifuge, and diuretic; and some have recommended it mixed with vinegar, as a very powerful remedy for the sea scurvy.

Medicinal Uses.—Antiseptic, given in doses of from one to two ounces; externally in solution, one ounce in ten ounces of water as a preventive of gangrene. The spirit of nitrous ether is valuable in advanced stages of fever, given in doses of three or four drachms.

Pterocarpi Lignum—*Red Saunders Wood.*

This tree is a native of the mountains of India and Ceylon, the wood of which is brought to England in billets, which are very heavy, and sink in water. It is merely used for its colouring matter, which it yields readily to spirits.

Quercus Cortex—*Oak Bark.*

This is prepared from the small branches in spring, when it contains four times its astringent principles to what it does in winter.

Resina Flava—*Yellow Resin.*

The residue in the retort, after the distillation of the oil from the common turpentine; but should the process, from the distillation of the turpentine, be carried on without water, what remains in the retort will be amber-coloured resin; but this is easily made yellow, by adding, while it is fluid, a small quantity of water, shaken together.

Medicinal Uses.—Diuretic, in doses of from four to eight drachms, combined with soap, in the form of a ball, making the bolus according to the directions of the college.

Sapo Castil—*Castile Soap.*

This soap is prepared in Spain, and takes its name from a city in that country. It is formed by the combination of barilla with olive oil; to which is added a small quantity of sulphate of iron, which gives it its marble appearance.

Medicinal Uses.—Slightly diuretic; rarely given alone; chiefly in union with resin.

Sapo Mollis—*Soft Soap.*

This is made in the same way as the above, with the exception, that potash is used instead of barilla or soda, and the colouring matter left out.

Medicinal Uses.—As the former; in case of gripes caused by the exhibition of sulphate of copper, from two to four ounces, dissolved in water, have been given with great success.

Sodii Chloridum—*Common Salt.*

The preparation of that kind of salt which is used for culinary and economical purposes (muriate of soda), depends upon the well-known fact, that the salt contained in the sea-water, or brine springs, being a fixed body, will not rise with the vapour of the water. All, therefore, that is wanted, is to expose any water, containing salt, to evaporation. The veterinarian employs common salt largely; and when sprinkled over hay, or in a mash, is liked by sick horses, to which it sometimes proves eminently beneficial.

Medicinal Uses.—Aperient; a solution of half a drachm of salt in four ounces of water, forms an excellent lotion for inflamed eyes.

SINAPIS—*Mustard.*

A genus of plants belonging to the class of *tetradynamia*, and to the order of *siliquosa;* and in the natural system it is ranged under the 39th order, *siliquosæ.*

Medicinal Uses.—This has been applied to the throat, chest, and bowels, in cases of inflammation. It is done by rubbing, which, exciting an outward irritation, allays the inflammation within.

SPIRITUS RECTIFICATUS—*Rectified Spirits of Wine.*

This may be obtained by distillation from any vegetable substance, in which the vinous fermentation is not completely over; the first result is ardent spirits, as brandy, rum, &c. It is from redistillation that rectified spirits are produced, which is very simple, being nothing more than the repetition of the process of distillation, with the addition, if necessary, of some alkali or lime, to destroy the empyrematic flavour, and absorb the water. Proof spirits is made by mixing nearly equal parts of water and rectified spirits.

Medicinal Uses.—Stimulant; principally used as a menstruum.

SULPHUR SUBLIMATUM—*Sublimed Sulphur.*

Sulphur is a well-known substance, sold in the form of a powder, or in solid pieces, when it is called brimstone. It is found in the neighbourhood of volcanoes; in the tract of land between Naples and the ancient Baiæ, called Solfa-terra, the smoking plains, the remnant of a half-extinguished volcano, it is found in great abundance. It is brought in large quantities to this country from Mount Etna, in Sicily; but is to be obtained in greater or smaller quantities near all volcanoes, of which the number throughout the world is considerable. It is also often found in coal mines; and, indeed, the common coal in our fires more or less contains this mineral. It often appears combined with iron, copper, and other metals, when it is called pyrites.

Medicinal Uses.—As a drug it forms the basis of the most effectual application for mange. When combined with nitre and antimony, it is an excellent alterative in cases of surfeit, grease, hide-bound, mange, or out of condition. In a cough or fever it is likewise a useful ingredient. As an opening medicine, it is not so good as many other aperients.

TEREBINTHINÆ VULGARIS—*Common Turpentine.*

This is procured from Scotch fir, when the tree is about forty years old, by stripping off the outer bark to the extent of six inches, so as to expose the inner smooth bark, near the foot of the tree, making a wound with an instrument three inches square, and one inch deep. From this incision the resinous juice soon begins to exude in transparent drops, which fall into a hole previously dug to receive them. Fresh incisions are continued to be made till the month of September. A healthy tree will yield from eleven to twelve pounds of turpentine annually, for a century. It is afterwards purified by filtration, through casks with holes in the bottom.

Medicinal Uses.—Diuretic; externally digestive; as a diuretic, given in doses of from one drachm to eight drachms, in form of a ball; as a digestive externally, it is used in the form of *unguentum. The oil of turpentine,* as an antispasmodic, for the removal of colic, has no equal. With cantharides, used as a blister, it is far inferior to the common ointment.

TEREBINTHINÆ VENETA—*Venice Turpentine.*

This is the product of the larch fir, obtained in a similar manner to the foregoing; but the largest quantity of the Venice turpentine is made by melting together the amber-coloured resin and oil of turpentine.

Medicinal Uses.—Similar to the foregoing, to which it gives place, possessing no advantage over it.

VERATRI RADIX—*White Hellebore Root.*

This plant is a native of the mountainous parts of Greece, Italy, Switzerland, Russia, &c. The root is dug in autumn, and dried.

CERUM—*Wax.*

The upper surface of the leaves of many trees is covered with a varnish, which may be separated and obtained in a state of purity, and which is found to possess all the properties of beeswax; hence it is justly inferred that wax is a vegetable product, and that the bees ex-

tract it unaltered from the leaves of trees, and other vegetable substances that contain it. Several plants contain wax, in such abundance, as to make it worth while to extract it from them.

Medicinal Uses.—In charges, and some plasters, the yellow soap is used to make them less brittle. In small doses (and with great attention), from one scruple to one drachm, frequently giving it, will produce a sedative effect: but if this effect be not narrowly watched, or if the dose be increased from one drachm, nausea will be produced, and violent irritation. As it is a powerfuel diuretic cathartic, it must be used with extreme caution. Externally it is combined with oil. It may, however, be used with advantage in affections of the skin, either in the form of decoction or ointment. We must repeat that, without the utmost care, it is a dangerous drug.

The *Black Hellebore* is used mostly as an external application, and has a strong, stimulating power. It has been resorted to with success in fistulous affections of the poll and withers. Professor Morton observes, "that an ointment, formed of either the white or black hellebore, in the proportion of one part of the powder to eight parts of larch, will be found exceedingly active for the dressing of rowels and setons."

ZINCI OXYDUM—*Oxide of Zinc.*

In chemistry and mineralogy, *zinc* was a metal unknown to the ancients, though they were acquainted with calamine, one of its ores, and the effect which this had in converting copper into brass. It is of a white colour, with a shade of blue; in a fresh fracture it is possessed of considerable lustre. It is hard, and not easily cut with a knife. The specific gravity is nearly 7·2. Its ores are calamine and blende.—Calamine is an oxide, frequently with a portion of carbonic acid; blende is a sulphuret, containing also some iron, and other extraneous matters.

Zinc is melted by a moderate heat; and the fused mass, on cooling, forms regular crystals. Though scarcely altered by exposure to the air at a low temperature, yet it is rapidly oxidised by one amounting to ignition. When kept in a degree of heat barely sufficient for its fusion, it becomes covered with a grey oxide. But when thrown into a crucible, or deep earthen pot, heated to whiteness, it suddenly inflames, burns with a beautiful white flame, and a white and light oxide sublimes, having a considerable resemblance to carded wool.

Medicinal Uses.—Tonic; but in the impure state, under the name of Calamine Powder, used as an ointment, known as "Turner's Cerate," it is invaluable. This ointment has been distinguished as "The Healing Ointment," and is composed of five parts of lard and one of resin, melted together. When these begin to cool, two parts of the calamine, reduced to an impalpable powder, are stirred in. On cracked heels, and superficial sores, calamine is sometimes advantageously sprinkled.

ZINCI SULPHAS—*Sulphate of Zinc—White Vitriol.*

Take of	Zinc, in small pieces . .	4 oz.
,,	Sulphuric Acid (by weight)	6 ,,
,,	Distilled Water . . .	4 pints.

Mix them in a glass vessel; and the effervescence having ceased, filter the solution through paper, then boil it till a pellicle appears. Set it by, that crystals may form.

Decomposition.—The same process acts here as in the preparations of the sulphate of iron and copper. The oxygen of the water unites to the zinc, converting it into an oxide of zinc, which is dissolved by the sulphuric acid forming sulphate of zinc; whilst the hydrogen of the water assumes the elastic form, and escapes.

Medicinal Uses.—Tonic internally; stimulant externally. As a tonic, it is given in doses from one drachm to half-an-ounce; but it is now rarely used at the College. It is used externally to promote healthy granulations; and may be applied either in the form of solution or ointment.

ZINGIBERIS RADIX—*Ginger Root.*

This plant is a native of the East Indies, but is now cultivated in the West Indies, to very great advantage. Our finest quality comes from Jamaica. The root is dug up after the herbaceous part of the plant is withered in January, and dried in the sun. There are many sorts in the market, but they all possess similar properties, differing slightly in strength.

Medicinal Uses.—Carminative, in doses from half-an-ounce to two ounces; in the form of ball it is the active ingredient in the *formulæ*, bolus *cardeavæ*. As a stimulant it is good. Equal parts of ginger and gentian, formed into a mass, with treacle, constitute the cordial mass of the best surgeons.

List of Medicines referred to in the first division of this Work.—In all the following compounds, No. I. *must be regarded as exhibiting the mildest form;* No. II. *as the next stronger;* No. III. *as still stronger; and so on, rising in degrees of strength, according to the numerals by which they are indicated.*

TAR LINIMENT.

Barbadoes Tar	2 oz.
Spirits of Turpentine	2 „
Opodeldoc	4 „

They must be well mixed together, and the bottle kept closely stopped.

LIQUID BLISTER.

No. I.

Powdered Cantharides	4 drachms.
Vinegar	4 oz.

No. II.

Cantharides	1 oz.
Vinegar	3 „
Spirits of Wine	1 „

Put into a bottle, and keep eight days before using. Two table-spoonfuls should be rubbed on the part affected night and morning.

SALINE DRAUGHT.

Glauber Salts	4 oz.
Linseed Meal	2 oz.
Hot Water	1 quart.

CORDIAL PECTORAL BALL.

Anise Seeds	1 oz.
Ginger	1 „
Liquorice	1 „
Caraway Seeds	1 „

Mix with treacle, and form into four balls, and give one, when required, fasting.

MERCURIAL ALTERATIVE BALL.

Barbadoes Aloes	4 drachms.
Calomel	1 drachm.
Ginger	1 „

Form a ball with soft soap.

DOSE OF PHYSIC IN EPILEPSY.

No. I.

Barbadoes Aloes	1 oz.
Powdered Ginger	2 drachms.

No. II.

Barbadoes Aloes	5 drachms.
Cape Aloes	5 „
Ginger	2 „

Mix with soft soap.

STIMULANTS IN SPASM.

Sulphate of Iron	12 drachms.
Cape Aloes	12 „
Juniper Berries	6 „
Myrrh	6 „

Mix with soft soap, and divide into eight balls, giving one every morning, fasting.

CORDIAL RESTORATIVE BALLS.

Powdered Gentian	6 drachms.
Anise Seeds	6 „
Liquorice	6 „
Antimony	6 „
Sulphur	6 „

Mix with treacle, and divide into four balls, giving one each morning.

PURGING BALLS.

No. I.

Barbadoes Aloes	4 drachms.
Ginger	1 „

No. II.

Barbadoes Aloes	6 drachms.
Ginger	1 „

Form into a ball with soft soap.

MERCURIAL PURGING BALLS.

No. I.

Barbadoes Aloes	1 drachm.
Calomel	1 „
Ginger	1 „

Form into a ball with soft soap.

No. II.

To be given the last thing at night.

Calomel	1½ drachm.
Linseed Meal	2 „

Form into a ball with honey.

In the morning give a warm bran mash, and at eight o'clock in the evening give

Barbadoes Aloes	5 drachms.
Gentian	2 „

Mix with soft soap.

ALTERATIVE MEDICINES.

No. I.

Antimony, powdered	8 oz.
Sulphur	8 „
Cream of Tartar	2 „

Divide into six powders, and cast one into the corn, previously watered.

No. II.

Cape Aloes	8 drachms.
Sulphur	12 „

Form into four balls with soft soap, and give one every other day

BLISTERS.

No. I.

Cantharides, powdered	2 drachms.
Hog's Lard	2 oz.

No. II.

Cantharides, powdered	4 drachms.
Hog's Lard	2 oz.

No. III.

Cantharides, powdered	6 drachms.
Mercurial Ointment	4 „
Hog's Lard	1 oz.

Lay this lightly on the part affected, after having removed all the hair.

LAXATIVE CLYSTER.

Thin Gruel	3 pints.
Common Salt	4 table spoonfuls.

Inject whilst warm.

DOSES OF PHYSIC IN INFLAMMATION OF THE FEET.

Blue Pill	8 drachms.
Cape Aloes	8 „
Resin	8 „

Mix with linseed meal, and form with soft soap into six balls. Give one every other morning.

No. II.

Calomel	2 drachms.
Barbadoes Aloes	6 „
Gentian	3 „

Form into a ball with honey.

DIGESTIVE OINTMENT.

No. I.

Common Turpentine	2 oz.
Hog's Lard	6 „

No. II.

Common Turpentine	4 oz.
Hog's Lard	12 „

No. III.

Common Turpentine	6 oz.
Hog's Lard	8 „

FOOT OINTMENT.

Tartar Emetic	1 drachm.
Hog's Lard	1 oz.

ALTERATIVE POWDERS.

Antimony	1 lb.
Sulphur	1 „
Cream of Tartar	4 oz.

Separate into twelve parts, and give one every night in the feed.

BLISTERING LINIMENT.

No. I.

Ol. Terebinth	3 oz.
Ol. Olivæ	3 „

No. II.

Cantharides	1 oz.
Ol. Terebinth	4 „

Apply three table-spoonfuls, after shaking up the medicine well.

COMMON DIGESTIVE OINTMENT.

Common Turpentine	4 oz.
Hog's Lard	2 „

Melt together over a slow fire.

HEALING OINTMENT.

Common Turpentine	2 oz.
Hog's Lard	2 „
Alum, powdered fine	3 „

The lard and turpentine must be melted together; the alum afterwards sprinkled in, and the whole stirred till the mixture is cold.

HEALING LOTION.

Sulphate of Zinc	8 oz.
Boiling Water	2 pints.

DIURETIC BALLS

No. I.

Powdered Resin	3 oz.
Linseed Meal	1 „

Divide into six balls, with soft soap.

No. II.

Powdered Resin	8 oz.
Nitre in Powder	4 „
Juniper Berries	4 „

Mix with soft soap, and divide into twelve balls.

In concluding this portion of our subject, we must observe, that the less a person has to do with medicine, whether for himself or his horse, the better; but there are occasions when it will assist nature, alleviate pain, and clear the way for a more speedy cure than might be expected if nature were left entirely to her own operations. Physicking horses is very common when they are taken up from grass, and its administration is, generally, admitted to be beneficial when they feed badly, and appear heavy, and especially if the eyes and mouth are of a yellowish colour. Proper attention to the airing of the stable, to its perfect cleanliness, and to feeding, exercise, and training, is the great duty to be attended to by those to whom the management of horses is assigned. Open air exercise is, above all things, essential to the well-being of every animal endued with the powers of locomotion. To the horse it is especially necessary; for, if kept in a stable without it, his degeneration becomes extremely rapid. This is soon evidenced by the decline of muscular power, and by the generation of disease in both the digestive and respiratory organs; by the growth of the hoof; the elongation of the toe; the inflammation of the frog; and, in short, by the whole body becoming diseased. Exercise is, therefore, not only essential to his health, but to his very existence. Let this, then, be regularly attended to, in conjunction with cleanliness and a proper regimen; and it will be found that medicine will not be required very often by the noblest conquest which man has made over the brute creation.

DIVISION II.

THE DOG AND ITS VARIETIES.

CHAPTER I.

ORIGIN OF THE DOG.

With something like a feeling of hesitation we enter on the history of the dog, respecting whose origin there are few naturalists agreeing with one another, and most of them suggesting different theories, having their rise in the reasoning of conjecture or probability, and little to support them beyond the speculations of ingenuity. To no animal is mankind so largely indebted for affection, attachment, and obedience, as to this. Among all the various orders of the brute creation, none has hitherto been found to identify itself so closely with the interests of his master; none has been found so admirably subdued to his purposes; and none so well adapted to watch or protect himself or his property in the hour of danger, darkness, or destruction. In both the old and the new worlds, there are many countries in which, if he were deprived of this faithful companion and ally, he would resist his enemies without success. His person would be insecure; his labour would frequently be vain; and his property would become a prey to the ravages of other animals stronger and swifter than himself. Whatever may be the amount of vigilance with which the Supreme Being has gifted him, there are many situations in which he could not be secure from rapacity on the one hand, or speed on the other; but in the dog he possesses the most faithful of friends; the most constant, whether in adversity or prosperity, and the only one that voluntarily lays all his extraordinary qualities at his feet; resigns himself up to his direction; obeys his voice under all circumstances; conforms himself to his movements, and identifies his own with the habits of his master.

> "It proclaims
> Th' audacious felon; foot by foot he marks
> His winding way—while all the list'ning crowd
> Applaud his reasonings—o'er the watery ford,
> Dry sandy heaths, and stony barren hills;
> O'er beaten paths, with men and beasts disdain'd,
> Unerring he pursues; till at the cot
> Arrived, and seizing by his guilty throat
> The caitiff vile, redeems the captive prey;
> So exquisitely delicate his sense!"

In the battle he is fierce; in the chase he is persevering; in the house he is watchful; and his patience is inexhaustible. In disposition he is so friendly that he seems only to remember the benefits he receives. Blows he soon forgets; and, generally speaking, in place of discovering resentment when he receives them, he licks the hand by which they were administered. It is no wonder that such an animal has, from remotest antiquity, attracted the notice, and received the countenance and favour of man, whether enrobed in the splendour of regal purple, or invested in the meanest and most fragmentary garments imaginable!

It was the opinion of Pallas that the dog is a factitious animal, not descended from any single original wild stock, but from a mixture of nearly allied primitive species, whose hybrid offsprings have possessed prolific powers; and he observes, that those domesticated animals,

which either do not intermix with other species, or which produce, with others, an unprolific progeny, are very little changed, however long and completely they may have been under the dominion of man. When, indeed, we look at the great differences in instincts, form, and size which the domestic dog exhibits, we find it difficult to believe, however they may interbreed, that they are all the lineal descendants of one common origin. Yet this opinion is the most generally entertained. Mr. Bell even goes a step farther, and refers the domestic dog to the wolf as its primeval parent; whilst others have referred it to the jackal.

Let us, however, examine what are the prevailing characteristics of these animals, and see how far resemblances exist between them and the dog.

The wolf has a robust but gaunt frame, a skulking or irresolute gait, ferocity mingled with cunning and cowardice, and a wild yet sinister expression of the physiognomy. Spread throughout Europe and various parts of Asia, it is more particularly in mountain and forest districts that he prevails, where the population is scanty, and collected into small towns or villages, with a wide country around, destitute of human dwellings. In the Pyrenees, the Carpathian mountains, in Poland, Hungary, some parts of Austria, France, Italy, and Spain; in Norway, Sweden, and Russia, the wolf is still common; as well as in western Asia, and the border territories included in Europe. Formerly this animal was abundant in the British Islands, and the plague and terror of their inhabitants. Verstegan, in his *Restitution of Decayed Intelligence in Antiquities, concerning the Most Noble and Renowned English Nation*, 1605, observes that January was called Wolf-monat by the Anglo-Saxons, "because people were wont, in that month, to be more in danger to be devoured of wolves than any season els of the yeare; for that through the extremity of cold and snow, those ravenous creatures could not find other beasts sufficient to feed upon." The universal fear which the wolf, where numerous, naturally inspired, was formerly heightened by superstition; and fiends or malignant spirits were imagined to have power to assume the form and character of this dreaded animal. Every child of five years old knows the nursery story of *Little Red Riding Hood*, who was deceived by the ferocious wolf. Lycanthropos of the Greeks, the Were-wolf of the Anglo-Saxons, and the Loup-garou of the French, had reference to some such preternatural monster, whose name was associated with all that is horrible and mysterious. Conspicuous then, and dreaded for its power and rapacity, it can scarcely be wondered that the wolf should have had its name assumed, or given to men of distinction, by our barbarous but warlike forefathers, among whom such appellations as Ethelwolf, Eadwolf, Berthwolf, and many more, were common.

Our Saxon ancestors, however, did not suffer the wolf to ravage the country unmolested. In the tenth century, under the reign of Edgar, the work of exterminating this animal began, and appears to have been carried on with success down to the thirteenth century; when, during the reign of Edward I., all historical record, by way of royal edict, ceases in reference to continuing the work of wolfine extirpation. The last record of their existence in any formidable numbers was in 1281. It is said by Mr. Topham, in his notes to Somerville's *Chase*, that it was in the wolds of Yorkshire where a price was last set upon a wolf's head. In Scotland and Ireland the wolf remained for a considerable period longer. In 1577, according to Hollinshed, wolves were destructive to the flocks in Scotland; and in Ireland they were exterminated only at the beginning of the last century.

From the numerous allusions to the wolf in the Scriptures, it is evident that it must have been well-known formerly in Syria—and indeed also in Egypt, for we find it figured on ancient sculptures, together with the hyæna and greyhound. At present, however, this animal is seldom met with in Syria, although it still exists in that region, but keeps itself concealed.

So habitually cautious and suspicious is the wolf, that it is difficult to take it in traps; and for the same reason, anything like the appearance of artifice, deters it from an attack. It has been supposed that it never carries its tail raised. This, however, is not altogether correct. A visit to the Zoological Gardens, in the Regent's Park, London, will enable the curious upon this point to satisfy themselves that wolves do elevate their tails whilst gallop-

ing round the area in which they are enclosed. Dr. Richardson states from observation, when they gambol with each other, they elevate their tails.

When pursued, the wolf rushes along, with his muzzle almost to the ground, his eyes glowing like fire, the hair of his neck and shoulders erect, and his tail lowered and drawn close; when out of danger, he slackens his pace, raises his head, sniffs about, and whisks his tail around, as if exulting in his escape; but if brought to bay by hounds, he defends himself to the last, and often kills and maims some of his antagonists before he falls overpowered by numbers. In hunting him, the Kirghese Tartars employ a large hawk, which fastens upon the animal's head, and tears out its eyes.

The power of the wolf, especially in the muscles of the head, neck, and shoulders, is immense; and his bite is terribly severe, generally cutting out the flesh with a snap. Among themselves they fight often with great desperation, the combat ending with the death of the weaker. It is said that wolves wounded by the gunshot of hunters or travellers, are torn in pieces and devoured by their fellows. This is not characteristic of the dog.

The average height of the animal at the shoulders is about two feet six inches. The female rears her young in some cave or gloomy recess, and produces from five to nine young at a birth. These are born with the eyes closed, *as in the dog*. In the defence of her offspring the female is furious, and greatly to be dreaded. The voice of the wolf is a prolonged howl, resounding dismally through the stilly darkness of the night. Not so the dog's.

On the southern side of the Pyrenees there exists a variety, perhaps, of the wolf, termed, from its colour, the Black Wolf—the *Loup noir* of Buffon. This animal is asserted to be more ferocious than the ordinary grey wolf; but, perhaps, without any foundation.

Desmarest says that the wolf is *solitary* and *nocturnal;* but that in winter it unites in troops, which attack horses and men. The sense of smell is very acute; but its speed is not very great, and it wearies out its victim by dint of untiring perseverance. When in full chase of its prey, it gallops along, pertinaciously following the track of the fugitive. Lord Byron, in his poem of *Mazeppa*, vividly depicts the scene of a troop of wolves in pursuit of their prey:—

> "We rustled through the leaves like wind,
> Left shrubs, and trees, and wolves behind;
> By night I heard them on the track,
> Their troop came hard upon our back,
> With their long gallop, which can tire
> The hound's deep hate and hunter's fire;
> Where'er we flew they followed on,
> Nor left us with the morning sun.
> Behind I saw them scarce a rood
> At daybreak winding through the wood;
> And through the night had heard their feet
> Their stealing rustling step repeat."

In almost every department of France infested by the wolf, there is a society called *Société de Louveterie*, the object of which is to keep that animal down; and premiums, varying in amount according to the sex and age of the animals killed, are likewise paid. The means hitherto employed, however, have been inadequate to effect the purpose. Although we can adduce several instances of the ferocity of certain species of dogs, there is nothing of which we are aware on record, which indicates a disposition at all approaching the unrelenting native ferocity of the wolf.

In the province of Posen, Prussia, in 1814, three grown persons and sixteen children were devoured by wolves in the small circle of Wongrowiec alone. When Prussia regained the province of Posen, in 1815, no time was lost by the government in getting rid of so great a public nuisance; and in that province, within five years, from 1815 to 1819 inclusive, 4,618 dollars were paid by the government in rewards for killing wolves.

In the parish of Briala, district of Rawa, during the month of August, 1837, four girls were torn to pieces not far from their own houses. This was in summer.

Mr. Lloyd, in his *Field Sports in the North of Europe*, relates many events respecting these animals. It would appear that they are less dangerous to man than might be expected, though they sometimes, especially when combined in troops, attack travellers with great audacity. A gentleman attached to the embassy of St. Petersburgh, narrated to him the following circumstance:—"It happened at no great distance from St. Petersburgh,

and only two years previously, that a peasant, one day in his sledge, was pursued by eleven of these ferocious animals. At this time he was only about two miles from home, towards which he urged his horse at the very top of his speed. At the entrance of his residence was a gate, which happened to be closed at the time; but the horse dashed this open, and thus himself and his master found refuge in the court-yard. They were followed however, by nine out of the eleven wolves; but very fortunately, at the very instant these had entered the enclosure, the gate swung back on its hinges, and thus they were caught as in a trap. From being the most ferocious animals, the nature of these beasts, now that they found escape impossible, became completely changed: so far, indeed, from offering molestation to any one, they slunk into holes and corners, and allowed themselves to be slaughtered almost without making resistance." There is not a single characteristic of the dog in this anecdote. Supposing that eleven dogs, hounds, mastiffs, bulls, or terriers, had pursued a man into his yard, and found themselves thus suddenly enclosed, would they have slunk into holes and corners, and exhibited such symptoms of fear and cowardice? On the contrary, we think that every one of them would have been more ardent than another in seizing their prey, and making a victim of the man who had given them such a run. Further on we shall give an instance of a pack of native wild dogs of India pursuing Colonel Sykes; but exhibiting no such traits of fear, although deterred from an actual attack by the report of fire-arms. The cowardice of the wolf presents, in our opinion, a perfect contrast to the courage of the dog.

It is said, that the mere act of striking a light with flint and steel has often the effect of intimidating a wolf; and that the rattling of a chain not unfrequently answers the like purpose. In the event of a person, when unarmed, being attacked by these bloodthirsty brutes, these things are worth knowing; for, although apparently trifling in themselves, they might be the means of saving his life.

In some parts of Scandinavia, when people are travelling, during the winter-time, over extended plains, lakes, &c., which are known to be much frequented by wolves, it is the custom to attach a long rope to the back of the sledge. The serpentine motion that this makes when the vehicle is proceeding, has, it is said, the effect of deterring these animals from making their attacks.

The common wolf of North America differs in some respects from its European relative, and is perhaps a distinct species. It wants the gaunt appearance, the comparatively long jaw and tapering nose, the high ears, long legs, slender loins, and narrow feet of the European wolf. Its frame also is more compact, the fur finer and thicker, the muzzle more obtuse, the head larger and rounder, and the forehead broader and more arched. The limbs are shorter, and the tail more fox-like and bushy.

Dr. Richardson, in his *Fauna Boreali-Americana*, enumerates several varieties of this North American wolf, depending on colour—viz., the grey, the white, the pied, the dusky or clouded, and the black. Black wolves abound on the Missouri; and, according to the Indians, black and grey wolves occur in the same litter. The dusky, or clouded wolf, was regarded by Say as a distinct species, and named by him *Canis nubilus*.

The American wolf agrees in its general habits with the wolf of the European continent, though it appears to be less formidable as far as man is concerned. Indeed, Captain Lyons, in his observations on the wolves of Melville Peninsula, states that both English and Esquimaux were accustomed to pass them without any weapon, or even a stick; "the animals, however, exhibited no symptoms of fear, but rather a kind of tacit agreement not to be the beginners of a quarrel, even though they might have been certain of proving victorious."

These wolves hunt in packs, and when pressed for food, assume an astonishing degree of boldness. They will seize the Esquimaux dogs before their masters' faces, and carry them off—although this species of dog is brave in attacking the bear, but is terrified at the wolf. They have been known not only to steal provisions from under a man's head in the night, but even to enter the bivouac of a traveller, and carry off some of his dogs. "During our residence at Cumberland House, in 1820," says Dr. Richardson, "a wolf which had been prowling round the

fort, and was wounded by a musket-ball and driven off, returned after it became dark, whilst the blood was still flowing from its wound, and carried off a dog from amongst fifty others, that howled piteously, but had not courage to unite in an attack on their enemy."

The American wolf is extremely cunning, and, in attacking moose, or Wapiti deer, animals which exceed it in speed, it has recourse to a singular stratagem. Several combine, and arrange themselves in the form of a semicircle, and thus advance upon their prey, so as either to hem it in or drive it over a precipice. Captain Franklin often found the remains of deer which had been thus dashed down steep cliffs and devoured; and he states that this is a frequent expedient when the plains are bounded by precipitous cliffs. "Whilst the deer are quietly grazing, the wolves assemble in great numbers, and, forming a crescent, creep slowly towards the herd, so as not to alarm them much at first; but when they perceive that they have fairly hemmed in the unsuspecting creatures, and cut off their retreat across the plain, they move more quickly, and with hideous yells terrify their prey, and urge them to flight by the only open way, which is towards the precipice, appearing to know that when the herd is once at full speed, it is easily driven over the cliff, the rearmost urging on those that are before. The wolves then descend at leisure, and feed on the mangled carcases."

On one occasion a troop of wolves endeavoured to put the same stratagem into practice against Dr. Richardson. Having the first watch, he "had gone to the summit of a hill, and remained seated, contemplating the river that washed the precipice under his feet, long after dusk had hid distant objects from his view. His thoughts were, perhaps, far distant from the surrounding scenery, when he was roused by an indistinct noise behind him; and, on looking round, perceived that nine white wolves had ranged themselves in form of a crescent, and were advancing apparently with the intention of driving him into the river. On his rising up they halted; and when he advanced, they made way for his passage down to the tents." This may be taken as an indication of that kind of instinctive intelligence which all wild animals, more or less, possess when actuated to preserve themselves from danger, or to hunt for their prey. In the wolf, it is, perhaps, somewhat remarkable.

Very different from the above respectful conduct which these wolves showed to Dr. Richardson, was that which a pack of them displayed to a poor Scandinavian soldier.

Whilst this unfortunate man was crossing a large lake, called Stor-sjön, it then being the depth of winter, he was attacked by a drove of wolves. He was armed only with a sword; but with this weapon he defended himself so gallantly, that he not only killed or wounded several of his assailants, but he succeeded in driving off the remainder.

Some short time afterwards, however, the same drove of wolves again beset him. He was now unable to extricate himself from his perilous situation in the same manner as before; for, when he laid his hand upon his sabre, and attempted to draw it, he found it firmly frozen into the scabbard. This was in consequence of his having neglected to wipe the blood from the blade after the desperate conflict in which he had been engaged. It is almost needless to add, that as he was then defenceless, the ferocious beasts quickly killed and devoured him.

In the dreary realms that advance into the Polar Sea—

> "Where the wolf and Arctic fox
> Prowl amidst the lonely rocks"—

Captain Franklin and his companions, during their arduous journeys, were often obliged to dispute their scanty food with the lean wolves, that would scarcely retreat. On one occasion, when they had captured a moose deer, and had buried a part of the body, the wolves absolutely dug it out from their very feet, and devoured it while the weary men were sleeping. On another occasion, when the travellers had killed a deer, they saw, by the flashes of the Aurora borealis, eight wolves, waiting round for their share of the prey. Sometimes, however, the wolves were their caterers, and helped them to a welcome meal. When a group of wolves and a flight of crows were discovered, the travellers knew there was a carcass to be divided, and they sometimes succeeded in obtaining a share of the prey, if it had been recently slaughtered.

Of the American wolves, we may notice the

Prairie wolf, the *Canis latrans* of Say, which inhabits the plains of the Missouri and Saskatchewan, as well as those of the Columbia. It is smaller and fleeter than the common wolf; associates in large troops, and dwells in burrows on the plains, remote from the forests. In Mexico is found a distinct species of wolf, the *Canis Mexicanus* of Desmartes; and a species termed the red wolf, inhabits the Pampas of La Plata. The Antarctic wolf is a native of the Falkland Isles, and seems to be an intermediate link between the wolves and foxes. It feeds principally upon a species of goose (*anser leucopterus*); goes in packs, which wander about by day, but more commonly in the evening, and burrow in holes. This species is about fifteen inches in height at the shoulder; the tail is short, and white at the tip; the limbs are short, but the contour of the head is wolf-like. It is termed by Pennant the Antarctic fox.

Colonel Sykes has described a wolf from Dukhun, under the title of *Canis pallipes*, which he states to be numerous in the open, stony plains of that region, but not to be met with in the woods of the Ghauts.

Mr. Hodgson notices the common European wolf as occurring in the lower region of the Nepaul Mountains.

Wolves are said to be particularly partial to dogs. This is noticed by Mr. Lloyd, in his *Field Sports in the North of Europe*, where he says, those animals usually picked up every one that was at large in this part of the country. Several were taken from both Risater and Uddeholm. *Caresse* was the drawing-room pet at the latter mansion, and was as fat and as sleek as a mole; but, happening to be star-gazing one evening, just outside the door, a famished wolf whipped her up in his horrid jaws, and was instantly across the lake with her.

The same writer gives us another instance of the audacity of these animals. "It was Christmas time, and there were fifteen or sixteen sledges in company; most of the horses were provided with such bells as are used in Scandinavia. In the middle of the cavalcade was a sledge occupied by a lady; at the back of the vehicle, as is frequently the case, sat the servant, who was driving; whilst on a bear-skin, which covered her feet, a favourite lap-dog was reposing. In passing through a wood, however, and in spite of the jingling of the bells, &c., a large wolf suddenly sprang from a thicket, when, seizing the poor dog, he leaped over the sledge, and was out of sight in a thick brake on the opposite side of the wood, in the course of a few seconds."

Fierce as the wolf is, however, it can be tamed, and even domesticated; but it requires to be taken very young; and this is, perhaps, one of the characteristics that brings this fierce, yet cowardly animal into relationship with the dog. M. F. Cuvier gives a very interesting account of a tame wolf, which showed all the affection that the most gentle dog could evince towards its master. When full-grown, he was presented by his owner to the menagerie at Paris. For many weeks he was quite disconsolate at the separation from his master, who had been obliged to travel; he would scarcely take any food, and was indifferent to his keepers. At length he became attached to those about him, and he seemed to have forgotten his old affections. His master returned after an absence of eighteen months; the wolf heard his voice amidst the crowd in the gardens of the menagerie, and, being set at liberty, displayed the most violent joy. Again was he separated from his friend; and again was his grief as extreme as on the first occasion. After three years' absence, his master once more returned. It was evening, and the wolf's den was shut up from any external observation; yet the instant the man's voice was heard, the faithful animal set up the most anxious cries; and the door of his cage being open, he rushed towards his friend, leaped upon his shoulders, licked his face, and threatened to bite his keepers when they attempted to separate them. When the man left him, he fell sick, and refused all food; and from the time of his recovery, which was long very doubtful, it was always dangerous for a stranger to approach him. He appeared as if he scorned any new friendships.

In this anecdote we have certainly evinced a strong resemblance to a similar sensibility in the dog; and it forcibly recalls the animal of Ulysses, so much celebrated in the *Odyssey*, for its memory, attachment, and faithfulness. The passage is well known, having been often quoted.

"Near to the gates, conferring as they drew,
Argus, the dog, his ancient master knew!
And not unconscious of the voice and tread,
Lifts to the sound his ears, and rears his head.
He knew his lord—he knew, and strove to meet;
He strove in vain to crawl and kiss his feet;
Yet, all he could, his tail, his ears, his eyes,
Salute his master, and confess his joys.
* * * * *
The dog, whom fate thus granted to behold
His lord, when twenty tedious years had roll'd,
Takes a last look, and having seen him, dies—
So clos'd, for ever, faithful Argus' eyes."

Other instances of wolf-domestication are on record; and they are taught, in the East, to go through certain performances in which we have seen dogs engaged in this country. This is more particularly the case in Persia, where, it is said, they are exhibited as spectacles to the people. There, when young, they are taught to dance. Buffon brought up several wolves. During their first year, he tells us, they were very docile, and even caressing; and, when well fed, would never disturb the poultry nor the other animals; but at the age of eighteen months or two years, their natural ferocity made its appearance, and they had to be chained up. One of them, up to its eighteenth or nineteenth month, lived peaceably and amicably with all things; but when he arrived at this age he made an attack upon the fowls, and killed the whole in one night, without eating one of them. This was evidently not the instigation of hunger, but of a wanton natural ferocity. Another, after breaking his chain, and killing a dog with which he lived in great familiarity, made his escape.

Before entering upon the theories which assign the wolf as the original of the dog, we will briefly describe the characteristics of the jackal, which has, also, had its advocates as being the original type of the dog. Of the animals known by this name, one species—*Canis Anthus*—is a native of Senegal; another, the Cape jackal—*Canis mesomelas*—is a native of the Cape of Good Hope; and a third, the common jackal—*Canis aureus*—is spread from the north of Africa, through Syria, Persia, and the greater part of India. Colonel Sykes states it to be numerous in Dukhun, where it is called Kholah by the Mahrattas. It is somewhat larger than a fox, but its tail is shorter in proportion, reaching only to the hock; its head is short, with a pointed muzzle; the general colour above is grey, abruptly divided from a paler tint spread over the under surface, and the tail is slightly tipped with black.

It is supposed to be the Shual of the Scriptures; is the Chical of the Turks; and is the Sciagal, Sciugal, Schiachal, or Shacal of the Persians.

The jackal goes in troops, which lie concealed in holes and burrows during the day, but come forth at night to hunt for food. They give chase to sheep or antelopes and other animals; like the wolf, stealing, fox-like, into fowl-roosts, and attacking any living thing they are capable of overcoming. They do not, however, confine themselves to living prey. Carrion, and offal, of every description, is acceptable to them, and they devour it with the utmost greediness. Nor are roots and fruits less sought after; in the vineyard they make great havoc, and their fondness for grapes is notorious. The "shriek" of the jackal is terrific Those travellers who have heard them, describe the nocturnal yells of these animals as extremely piercing and dissonant; now close, now at a distance—troop answering troop from different points—themselves unseen; while their fearful chorus breaks the stillness of the hours of darkness. Their cries thus heard amidst the ruins of cities of ancient date, might seem "to listening Fancy's ear" like the wail of legions of spirits over the departed glories of other days. Mouldering ruins, fallen temples, crumbling tombs, and craggy rocks, are the abodes of the jackal.

Sly and suspicious in its disposition, the jackal, when taken young, is nevertheless easily tamed, and loses that unpleasant odour which renders the wild animal almost intolerable. There is, we believe, in the Zoological Gardens, a hybrid, between the jackal and the dog.

Having thus described and illustrated, by anecdote, the disposition of the wolf, and described the characteristics of the jackal, we are sufficiently prepared to show the arguments assigned by various naturalists for the different theories they have advanced in reference to the original type of the dog. Mr. Bell is one of the most eminent defenders of the wolf theory.

"In order," says he, "to come to any rational conclusion on this head, it will be necessary to ascertain to what type the animal

approaches most nearly, after having, for many successive generations, existed in a wild state, removed from the influence of domestication and of association with mankind. Now, we find that there are several different instances of dogs in such a state of wildness as to have lost that common character of domestication, variety of colour and marking. Of these, two very remarkable ones are the Dhale of India and the Dingo of Australia. There is, besides, a half-reclaimed race amongst the Indians of North America, and another also partially tamed in South America, which deserve attention; and it is found that these races, in different degrees, and in a greater degree as they are more wild, exhibit the lank and gaunt form, the lengthened limbs, the long and slender muzzle, and the great comparative strength which characterise the wolf; and that the tail of the Australian dog, which may be considered as the most remote from a state of domestication, assumes the slightly bushy form of that animal. We have here, then, a considerable approximation to a well-known animal of the same genus, which, though doubtless descended from domesticated ancestors, have gradually assumed the wild condition; and it is worthy of special remark, that the anatomy of the wolf, and its osteology in particular, does not differ from that of the dog in general, more than the different kinds of dogs do from each other. The cranium is absolutely similar, and so are all, or nearly all the other essential parts; and to strengthen still further the probability of their identity, the dog and wolf will readily breed together, and their progeny is fertile. The obliquity of the position of the eyes of the wolf is one of the characters in which it differs from the dog; and although it is very desirable not to rest too much upon the effects of habit on structure, it is not perhaps straining the point to attribute the forward direction of the eyes in the dog, to the constant habit, for many successive generations, of looking towards its master, and obeying his voice." Mr. Bell adds, as another corroborative circumstance, the fact that the period of gestation in the dog and the wolf is the same—sixty-three days; while in the jackal it is fifty-nine days.

The opinion of so eminent and judicious a naturalist is certainly entitled to great weight; but while it is admitted that Mr. Bell has made a strong case, it must be observed that he is defective in several of his points. In the first place, it is assumed that all wild dogs are the descendants of a domestic race; but though, respecting some few, this may be true, yet it by no means follows that the assertion applies to all. The Búánsú, or wild dog of Nepaul, described by Mr. Hodgson under the title of *Canis primævus*, may be given as an example. This animal, which is believed to be the origin of the domestic dog, and not its descendant, ranges from the Sutlege to the Burhampootra; and seems to extend, with some immaterial differences, into the Vindyia, the Ghauts, the Nilgiris, the Casiah Hills, and the chain passing brokenly from Mirzapore through south Bahar and Orissa to the Coromandel coast. In the zoological proceedings, it is stated, that of this race, although so wild as rarely to be seen, Mr. Hodgson has succeeded in obtaining many individuals. He is consequently enabled to describe not only the form and colours, but the manners also, which he does in great detail. Some of those he obtained produced young in captivity, having been pregnant when taken. The Búánsú, he observes, preys by night as well as by day, and hunts in packs of from six to ten individuals, maintaining the chase rather by its powers of smell than by the eye, and generally overcoming its quarry by force and perseverance. In hunting it barks like a hound; but its bark is peculiar, and equally unlike that of the cultivated breeds of dogs, and the strains of the jackal and the fox. Adults in captivity made no approach towards domestication; but a young one, which Mr. Hodgson obtained when it was not more than a month old, became sensible to caresses, distinguished the dogs of its own kennel from others, as well as its keepers from strangers; and, on the whole, its conduct manifested, to the full, as much intelligence as any of his sporting dogs of the same age.

W. A. Wooler, Esq., also gives an account of a wild dog from the Mahablishwar Hills, in the Presidency of Bombay, and called there Dhale. The habits of this dog, in a state of nature, are similar to those of the Búánsú of Nepaul, with which animal it is most probably identical. Colonel Sykes proves that the wild dog of the Dukhun, called by the Mahrattas

Kolsun, is the same as the Búánsú of Nepaul; the skulls and external characters exhibiting precisely the same formation and features. That gentleman further observes, that this dog differs from every wild species hitherto described. Its head is compressed and elongated; its nose not very sharp; the eyes are oblique, the pupils round, the irides light brown. The expression of the countenance is that of a coarse, ill-natured Persian greyhound, without any resemblance to the jackal, the fox, or the wolf; and, in consequence, essentially distinct from the *Canis Quao*, or *Sumatrensis*, of General Hardwicke. The ears are long, erect, and somewhat rounded at the top; the limbs are remarkably large and strong in relation to the bulk of the animal, which is intermediate in size between the wolf and jackal. It hunts in packs; and in the stomach of one killed was found a portion of the Nylghau antelope.

Here, then, is a genuine wild dog, called in the different mountain districts it inhabits, Búánsú, Dhale, and Kolsun, of a sandy-red, or rufus colour, and destitute of the last small molar of the lower jaw. Colonel Baber, in a note subjoined to Colonel Syke's description in the *Transactions of the Asiatic Society*, states, that it was often seen by him on the western coast, and in the Balaghát district, where it is numerous. "As often," he adds, "as I have met with them, they have invariably been in packs of from thirty to perhaps sixty. They must be very formidable, as all animals are very much afraid of them. Frequently remains of hogs and deer have been brought to me, which had been taken overnight by these wild dogs. The natives assert that they kill tigers and chetahs, and there is no doubt of the fact. It is quite correct that they are found in the Nilgiris, though only in the western parts. I, myself, was followed, while travelling between the Paitera river and Naddibatt, a distance of eight or nine miles, by a pack of them; and had I not repeatedly fired off my pistols, they would certainly have carried away three or four terriers and Spanish dogs that were following me at the time. Two or three times I succeeded in getting young ones; but I did not keep them longer than three or four weeks, they were so very wild, as well as shy. It was only at night they would eat, and then most voraciously."

The *Canis Quao* of General Hardwicke, is a red wolfish-looking dog in the Ramghur Hills; and the *Canis Sumatrensis* is a wild dog of the same general character, found in Sumatra, but with ears less acutely pointed.

All accounts of wild dogs concur in stating the fact, that their colour is always sandy-yellow or red, a colour occasionally seen in animals of the domestic breeds, such as in one of the species of the Scotch terrier. That these wild dogs are genuine, we think there cannot be the slightest doubt; and, if so, what becomes of the wolf theory of Mr. Bell? Besides, we cannot see, by what possible power of inter-breeding, either a setter, or a spaniel, or a "Maltese lion dog," could be produced from a wolf. At the "National Dog Show," held at Islington, in 1862, every species of dog was exhibited, the whole comprising upwards of eight hundred specimens, and every one showing some different character, which made it distinct from another. Here the huge boar-hound, down to the toy-terrier, of 2½ lbs. weight, was to be seen; and is it possible that the original of all these was a hungry gaunt wolf, with the sanguinary qualities of the tiger, and the ferocity of the hyæna? The same, or similar arguments might possibly apply to the wild dogs of India; but inter-breeding from species of the same kind, is much more likely to produce variety, in the lapse of ages, than inter-breeding from species originally distinct, although bearing a close resemblance to each other. We do not, however, when we contend that these wild dogs are genuine, pretend to assert that any of them are the originals of any one of our domestic breeds. All we wish is to prove that there are genuine wild dogs; which fact being established, the necessity of looking to the wolf as the origin of the dog falls to the ground, for these wild dogs are not wolves.

In the next place, though the wolf and dog will breed together, their progeny, if fertile, as Buffon seems to prove, is so in a low degree only, the mixed race gradually failing, and becoming extinct. It has also yet to be seen, whether there exist a race of true wolves, the descendants of dogs, which have returned to their natural state, and reassumed their original characters. If the wild dogs, described above, and regarded as genuine, be really the

descendants of a domestic stock, even then, seeing that they have resumed their original characters—as evidenced by their uniformity of size, figure, colour, and instincts—the argument that the wolf is the primeval type of the dog is at once nullified; for these rufus wild dogs are distinct from the wolf. While thus venturing to question the theory of Mr. Bell, and other eminent naturalists, we are not prepared to point out the origin or origins of the domestic dog; and we venture to say that the subject will always remain a Gordian knot, which science will never unravel. Buffon has eloquently observed, that "those species which man has greatly cultivated, whether belonging to the animal or the vegetable world, are, beyond all, those which are the most altered; and as the alteration is sometimes to such a degree, that we cannot recognise in them anything of their primitive form —such being the case with wheat, which has no resemblance to the plant from which it is supposed to have derived its origin—it is not impossible, that among the numerous varieties of the dog which we see in the present day, there is not one which bears a resemblance to the original type, or rather, to the first animal of the species."

Mr. Richardson, in his treatise on *The Dog*, also positively denies the assumed identity of structure between that animal and the wolf, set forth by Mr. Bell. He says the intestines of the wolf are considerably shorter than those of the dog, evidently marking him as an animal of more strictly carnivorous habits. The orbits are placed higher, and more forward in the skull. The proportion between the bones of the hind legs differs; so does the number of toes. The structure of the teeth is different; these being in the wolf much larger, whilst the molar teeth of the upper and lower jaw are adapted to each other; in the wolf, in a peculiar *scissors*-like manner, rendering them infinitely more serviceable for breaking bones—a structure not found in the dog.

"The wolf is not 'susceptible of the *highest degree of domestication*, and capable of great affection for mankind, which has been abundantly proved of the wolf.' When has it been proved? I have seen many so-called 'tame wolves,' but never one that might be trusted; or that did not, when opportunity offered. return to his fierce nature and wild habits. The whelps, too, produced by these partially *domesticated* wolves, are not in the smallest degree influenced by the domestication of their parents. The Royal Zoological Society of Ireland had, some years ago, in their garden in the Phœnix Park, a pair of very tame wolves. These produced young, which became tame likewise, and, in their turn, produced cubs. The society very kindly presented me with one of the last-mentioned cubs, which, though only five weeks old when I took him from his dam, was as fierce and violent in his own little way as the most savage denizen of the forest. I brought up this animal among my dogs; for *them* he conceived a considerable degree of affection, or respect, perhaps; for *submission* was the most striking feature of his conduct towards them; and was, doubtless, induced by the frequent and substantial castigations he received. He never, it is true, exactly dared to attack me in front, but he once showed a disposition to do so when I pulled him down by the tail as he was endeavouring to get over the garden wall. He, however, on several occasions charged at me from behind, when he thought my attention was otherwise engaged. He once only succeeded in inflicting a severe bite; and by this time I had utterly despaired of making anything of him: he was about eighteen months old; I sent him about his business. He subsequently fell into the hands of a showman, and assumed his proper character in the caravan." These observations, while they militate against the theory of Mr. Bell, concur with those of Buffon, in reference to the experience which that great naturalist obtained in rearing his own wolves. He found them, like Mr. Richardson, well enough up to their eighteenth month, but, after that period, the innate savageness of their nature began to discover itself, and there was little or no safety in their presence.

"As to dogs," continues Mr. Richardson, "when accident drives them to subsist on their own resources, thus rendering them wild, they assume feral characters; but as to their thus acquiring, in the course of a few generations, the habit and aspect, or the general similitude of wolves, I conceive it to be an assertion only, and one that has yet to be proved. Even such

dogs as have been thus driven into feral and independent life, will be found ever ready to acknowledge the control of man, and may, with comparatively little trouble, be induced to return to their allegiance to him. Nor will the whelps of such *re-domesticated* dogs be *born wild*, as is the case with the cubs of the tamest wolves. In the case of these dogs, circumstances, and not natural instinct, have driven them wild; and these circumstances ceasing to operate, domestication returns.

"How does it happen that the dog is to be met with in every quarter of the globe to which man has penetrated, while the true wolf has never yet been met with south of the equator? Further, are not several distinct species of wolf admitted to exist? * Is there not more than one distinct species of wolf admitted by naturalists to exist in North America alone? It has not even been attempted to be proved that these species are identical; their distinctness has been more than tacitly admitted. Yet they resemble each other far more closely than any wolf does the dog. Has the dog, then, been derived from each and all of these wolves; or has the original wolf, origin alike of wolf and dog, been yet properly indicated? Should not this fact be duly ascertained prior to that in question?

"The wolf and the dog will not breed together *in a state of nature*. In their native forests they clearly will not, or the wild dog would not still remain distinct from the wolf, whose lair is in the immediate neighbourhood of his own. Man's effort and skill, combined with partial domestication, may, indeed, induce a union between them; but naturally they shun each other, and mutually exhibit a strong natural antipathy.† Nor will these animals—the wolf and the dog—breed together, unless one of them, at least, be thoroughly domesticated. How else have all attempts to produce a breed between the wolf and Australian dingo so signally failed?"

The simple breeding together of animals, and the fertility of their offspring, is not a sufficient proof of identity of species. Mr. Hodgson has shown that the *capra tharal*—the goat of Nepaul—and the domestic goat will breed together. The hunchbacked zebu, of India, will breed with our common cattle, and the offspring is prolific. Pallas has stated that, in various parts of Russia, the sheep and the goat have bred together; whilst Chinese and European pigs, differing, according to Mr. Eyton, in important osteological particulars, will do so likewise.

In *The Animal Kingdom, arranged after its Organisation*, by Baron Cuvier, the following opinions, translated by Mr. Blyth, are given by that distinguished naturalist upon this subject. Speaking of the dog, and his supposed subjugation to the power and intelligence of man, he says,—"The domestic dog is the most complete, the most singular, and most useful conquest ever made by man, the whole species having become his property. Each individual is devoted to its particular master, assumes his manners, knows and defends his property, and remains attached to him until death; and all this, neither from constraint nor want, but solely from gratitude and pure friendship. The swiftness, strength, and scent of the dog have rendered him a powerful ally to man against other animals, and were even, perhaps, necessary to the establishment of society."

In reference to the origin of the dog, Mr. Blyth, in a note to his translation of the Baron's *Règne Animal*, argues in favour of the wolf theory. He says—"If the idea, which I conceive there is every reason to entertain, respecting the origin of the domestic dog be well founded, it is clear that a recurrence to a single wild type would be impossible. The dog is apparently a blended race, derived principally from the wolf, and partly from various other allied species. In the museum of the Zoological Society of London, there is a specimen of an Esquimaux dog (*C. nubilus*), which resembles the large American wolf so closely, that there can scarcely be any doubt of the connection which subsists between them; and it is well known, of the American wolves in particular, that if a young animal be surprised by a hunter, and suddenly menaced by his voice and manner, it will crouch to him, and implore his mercy in precisely the manner of a spaniel; so that only a little encouragement and kindness is required to gain its permanent attachment. Indeed many of them are killed

* We have shown this in our previous pages.

† This we have also shown in our illustrative anecdotes.

to obtain a proffered reward, by taking this (assuredly unworthy) advantage of their natural submissiveness. That the wolf possesses the mental qualities, and is capable of the same strong attachment to man as the most faithful dog, has been abundantly proved by the observations of M. F. Cuvier and others; and the unremitting persecution to which it has been necessarily subjected in Europe, for so many years, will sufficiently account for the savage and distrustful character which it exhibits when unreclaimed; though even then the germs of a better disposition are traceable in the permanent attachment of the male and female, and sociality of the young, till urgent necessity, or the annual period of dominant sexual excitement, subdues every milder propensity and acquired sentiment of friendship or disinterested affection.

"Instances occasionally happen of the dog returning by choice to a state of wildness, and assuming then, of necessity, the character ascribed to the wolf. I have known this to occur in a male pointer, and in a female greyhound: the latter was so fine a specimen of the breed, that, on being entrapped, it was thought desirable to obtain a litter from her, which was accordingly effected; but, while her puppies were very young, she managed to escape to the woods, and never returned: three of her progeny grew to be excellent hounds; but two others proved quite irreclaimable; and escaping from servitude, like their dam, were finally shot, for their destructive poaching propensities."

In the *Zoology* of Dr. Carpenter, we find it stated that "the common dog is a species of the genus *canis*, belonging to the family *canidæ*, of the order *carnivora*, of the class *mammalia*, and the division *vertebrata*. From the information conveyed to us by the term *vertebrata*, we learn that it has an internal skeleton, with a jointed back-bone and skull, containing the spinal marrow and brain, the centres of the nervous system; and that it has five senses, four extremities, and red blood. The knowledge that it is among the class *mammalia*, implies that it is a warm-blooded animal, breathing air, possessing a heart with four cavities, a complete double circulation, produces its young alive, nourishes them afterwards by suckling, and has the body, more or less, covered with hairs. By referring it to the order *carnivora*, we know that it is in its natural state a beast of prey, adapted by the formation of its teeth, and the digestive apparatus, to feed upon animal flesh; and by the structure of the extremities, to pursue and attack the animals which serve as its prey. As one of the family *canidæ*, we know that it resembles, in some respects, the wolves, foxes, jackals, and hyænas, as well as the cats, in being *digitigrade* (that is, in walking on the ends of the toes), and that it differs from the cat in not being so much adapted to destroy its living prey, as to feed upon animals already killed; the mouth not being formed so exclusively for cutting and tearing as is the cat's, and in the claws being neither so long and sharp, nor capable of being pushed forth or withdrawn, as in the feline tribes. Again, the dog differs from the fox and hyæna in certain peculiarities in the form of the teeth; but his relationship to the wolf is so close, that many naturalists have regarded them as sprung from the same stock. Then, while the dog belongs to a genus distinct from the hyæna and fox, it is identical with the wolf and jackal in generic character, and it may be that it does not even constitute a species distinct from the wolf. But, while some characters are constant in each race, others may undergo great variation; so that, within the limits of one species, we may have a large number of varieties, or breeds, marked by differences much greater than those which, in other cases, are held to distinguish species. This is especially the case in domestic animals; and in none is it shown more strongly than in the dog. How different, for example, are the greyhound, the mastiff, and the bloodhound! We should scarcely imagine that any period of time, or external influence, could ever convert one of them into the other. Yet the zoologist feels no hesitation in affirming that they had one common origin; since it is found that their distinct forms are preserved only so long as they are matched in breeding with forms of the same kind. Hence there is no difficulty in reconciling the diversities actually existing among the various races of dogs with the idea of one common origin, of which they are modifications. When and how the several breeds arose, is less easily determined."

Among so many conflicting statements, it is,

perhaps, utterly impossible to determine the true origin of the dog. Mr. Bell, and others, argue for the wolf theory. Mr. Hodgson and others do the same for the primitive wild dog theory; and Professor Kreischner does the same for the jackal theory. He says that there is a kind of jackal in the Frankfort Museum, exemplifying all the types of the ancient Egyptian dog. To this theory of the jackal, however, we cannot, for a moment, lend ourselves. To be sure, it is said that the manners of this animal bear a very close resemblance to those of the dog. When taken young it soon becomes domesticated; attaches itself to mankind, wags its tail when pleased, and distinguishes its master from other persons. It likes to be fondled and patted with the hand; and, when called by name, will answer to it, and leap on a chair. It drinks as the dog does, by lapping, and it will eat readily from the hand: it is even fond of playing with dogs, and eats bread with eagerness. These qualities induced Mr. Pennant to think, with Professor Kreischner, that the various races of the dog were indebted to the jackal for their origin. To this pleasing canine portrait, however, that of Buffon presents a very great contrast. He says that the jackal is stupid and voracious; that it is very difficult to be tamed; and that he had one which was kept for nearly a year, when neither food nor caresses could mollify the fierceness of its disposition. Although it had been taken young, and reared with the utmost care, it would suffer no one to touch it, and would bite at any one indiscriminately. When occasionally allowed a little liberty, it amused itself by leaping on the tables, and devouring everything suitable to its palate. Its voracity, he says, was enormous. If it could get nothing better, it would eat the leather for harness, and boots or shoes. It would eat the most putrid bodies, disinter the dead, attend caravans, and follow armies, to feast on the remains of the fallen or the slain. Such a brute does not appear, to our mind, to exhibit a single trait of the dog, to the extent that would lead us to coincide with the theory which would place the jackal as the original of that generous animal; but, as the opinions of eminent naturalists are so different from each other, it is difficult to decide between them.

Another theory advanced is, that the shepherd's dog is the original type; but it is thus combated by Mr. Richardson:—

"Many naturalists, and these natives of different countries, have advanced this theory, and still they have all employed the one designation in indicating their favourite type—viz., the shepherd's dog. I must here first take the liberty of inquiring *what shepherd's dog?* for shepherds' dogs differ most materially from each other. Buffon stood up for the originality of the *matin*, or shepherd's dog of his own country. Later writers, copying more or less from him, have adhered to the theory of the sheep-dog origin, while they have forgotten the difference which exists between their own national sheep-dogs and those indicated by Buffon. Truly there exists but little similitude between the tailless, woolly-looking animal, the sheep-dog of England, the fox-like colley of Scotland, the gaunt and short-haired cur of Ireland, the matin of Buffon, the noble, stately, and powerful sheep-dog of the Pyrenees, the guardian of the flocks of the Abruzzi, the gigantic mastiffs, the herd-dogs of the Himalaya mountains, and, in short, between various other sorts of sheep-dog, used for tending flocks in as various portions of the known world. Shall we assume the original type to have been the sheep-dog or matin of France, or the more graceful colley of Scotland? Are we to believe that a brace of either of these dogs were the progenitors of the entire canine race? Did the gigantic boar-dog, the noble Newfoundland, the courageous and powerful mastiff, the slender and rapid greyhound, the stunted yet formidable bulldog, the diminutive and sensitive Blenheim spaniel, and the still more diminutive, and now almost extinct, lion-dog of Malta—all arise from a brace of curs? If they did, to what now are we to attribute the varieties at present existing? We are told to climate and breeding. As to breeding, how could it operate when there was but a single pair to breed from? How, if the varieties of the dog proceeded but from one original type, could development thus be produced, extending beyond the limits of the faculties and powers proper to that type? Will change of climate ever convert a greyhound into a bulldog? Will it truncate the muzzle, raise the frontal bones, enlarge the frontal sinuses, or effect a positive alteration of the posterior

branches of the lower maxillary bones? Or will change of climate, on the other hand, operate to convert a bulldog into a greyhound, produce a high and slender form, diminish the frontal sinuses, deprive the animal of the sense of smell, at least comparatively, together with courage and other moral qualities depending on organisation? I say nothing: I only ask my intelligent readers—do they believe this possible? Thus far, a very eminent naturalist, Colonel Hamilton Smith, goes with me, hand in hand; all that I have adduced he admits; but here we unfortunately part company. Colonel Smith seeks to account for these differences by calling in the intervention of a supposed admixture of wolf, fox, or hyæna, &c. He admits an originally-formed dog, and one variety only; and refers for the alterations that have taken place in him to crossing with these wild animals. Now I consider this theory as even less tenable than that of the wolfish or vulpine origin of the dog, as the colonel is obliged to bring several races of wild dogs to his aid; and, may I venture to inquire, where is *their* origin? Besides this, we have to refer to the decided antipathy subsisting between these animals in a state of nature, and thus effectually precluding intermixture, unless through human intervention and agency, which clearly was never exerted in that condition for this purpose.

"It is," says Mr. Richardson, "in far remote ages of 'The Earth and Animated Nature' that we have to seek for traces of the origin of this sagacious and generous animal, which has enjoyed the especial privilege and well-merited honour of being, *par excellence*, the FRIEND OF MAN."—In this opinion we concur. We further believe—for it must resolve itself into a matter only of belief where all reasoning is contradictory, and therefore in a great measure nugatory—that, however close his alliance may be to the wolf or the jackal, neither of these animals are his original. He has, in our opinion, an original of his own; and, however thick may be the veil which shrouds this in obscurity, his intelligence being next to that of man, stamps him as a creation as distinctly original as that of the half-reasoning elephant.

So nearly akin is the intelligence of the dog to reason, that we are sometimes puzzled to account for the actions which result from it.

"Lo! the poor Indian, whose untutor'd mind
Sees God in clouds, and hears him in the wind,
* * * * * *
And thinks, admitted to that equal sky,
His FAITHFUL DOG shall bear him company."

The poets of different ages and of various lands would seem to have delighted in commemorating the virtues of this favourite animal. Of this we have already given an illustration from the Homeric poems, and we will now give one from the Virgilian Georgics:—

"Nor last forget thy faithful dogs; but feed
With fattening whey the mastiff's gen'rous breed,
And Spartan race, who, for the fold's relief,
Will prosecute with cries the nightly thief;
Repulse the prowling wolf, and hold at bay
The mountain robbers rushing to the prey.
With cries of hounds thou may'st pursue the fear
Of flying hares, and chase the fallow deer;
Rouse from their desert dens the bristled rage
Of boars, and beamy stags in toils engage."

Walter Scott was also passionately attached to dogs; and, in some of the most graphic and picturesque scenes in his beautiful novels, several of these find a prominent place. Their fidelity and sagacity, exemplified on many occasions, were to him a source of great enjoyment. In allusion to these qualities, as exhibited by one, in the case of a traveller who had been dashed to pieces by falling from a precipice of Helvellyn, he says—

"Nor yet quite deserted, though lonely extended,
For faithful in death, his meek favourite attended,
The much-loved remains of her master defended,
And chased the hill-fox and the raven away.
How long didst thou think that his silence was slumber?
When the wind moved his garments, how oft didst thou start?
How many long days and long weeks didst thou number,
Ere he faded before thee, the friend of thy heart?"

The circumstances which suggested this poem were detailed to a tourist by one of the guides who conducts visitors to the summits of Skiddaw and Helvellyn. The unfortunate man who perished amidst these solitudes, was a resident of Manchester, who was periodically in the habit of visiting the lakes, and who, confiding in his knowledge of the country, had ventured to cross one of the passes of Helvellyn, late in a summer afternoon, in company only with his faithful dog. Darkness, it is supposed, came on before his expectation; he wandered from the track; and fell over the rocks

into one of those deep recesses where human foot never treads. The dog was found by the side of his master's body, after many weeks' fruitless search. The man who told the story concluded with the pious exclamation of—"God knows how the poor beast was supported so long."

Wordsworth has also written on this subject; but his poem is too long for quotation here; the following, however, are four of the stanzas most appropriate to our subject:—

"A barking sound the shepherd hears,
A cry as of a dog or fox;
He halts and searches with his eyes
Among the scattered rocks:
And now at distance can discern
A stirring in a brake of fern;
From which immediately leaps out
A dog, and yelping runs about.

"The dog is not of mountain breed;
Its motions, too, are wild and shy;
With something, as the shepherd thinks,
Unusual in its cry:
Nor is there any one in sight,
All round, in hollow or in height;
Nor shout nor whistle strikes his ear:
What is the creature doing here?

"It was a cove, a huge recess,
That keeps till June December's snow;
A lofty precipice in front,
A silent tarn below.
Far in the bosom of Helvellyn,
Remote from public road or dwelling
Pathway or cultivated land,
From trace of human foot or hand.

"But hear a wonder now, for sake
Of which this mournful tale I tell!
A lasting monument of words
This wonder merits well.
The dog, which still was hovering nigh,
Repeating the same timid cry,
This dog had been, through three months' space,
A dweller in that savage place."

As an appropriate close to this chapter, we will give the epitaphs written by two of our most celebrated poets, upon their favourite dogs. "Maida," the first, was the deer-hound of Sir Walter Scott, presented to him by Macdonald of Glengarry, and was a splendid animal. He lies buried at the gate of Abbotsford, of which he was long the guardian:—

"At thy master's gate here, Maida,
Lowly dost thou rest;
Light the low-relievo marble
Lie upon thy breast."

"Boatswain" was the favourite Newfoundland of Lord Byron:—

"The poor dog! in life the firmest friend,
The first to welcome, foremost to defend;
Whose honest heart is still his master's own—
Who labours, fights, lives, breathes for him alone."

CHAPTER II.

HISTORY OF THE DOG.

THE *Canidæ*, or *Canine family*, includes the Dog, the Wolf, the Jackal, the Fox, and the Lycaon; in other words, all those animals which Linnæus assigns to his genus *Canis;* and which, though agreeing in dentition, and in the digitigrade structure of the feet, may, nevertheless, with propriety, be divided into sub-generic groups. In all, the muzzle is elongated; the bony palate terminates in a line with the hinder margin of the posterior molars, in this respect differing from that of other *carnivora*; and there are two true molars on each side of the upper and lower jaws. The genus *Megalotis*, in the form of the lower jaw, in the dentition, and in the prolongation of the bony palate, offers an exception to the general rule.

Dental formula:—Incisors, $\frac{6}{6}$; Canines, $\frac{1-1}{1-1}$; Molars, false $\frac{3-3}{4-4}$, carnassières $\frac{1-1}{1-1}$, true $\frac{2-2}{2-2}$ = 42.

The true molars below are small, the last being even minute, as is the first false molar, and often dropping out early.

Fore feet, with five toes; hind feet, with four toes, and sometimes a fifth on the tarsus; claws not retractile.

The following is the arrangement of the groups into which the breeds of the domestic dog have been thought to resolve themselves:—

1. Dingo—semi-domestic?
2. Esquimaux dog?
3. Hare Indian's dog?

To what groups these respectively belong is not very clear; probably to the first or second of the following groups:—

Ears sharp, erect, or sub-erect; nose pointed; hair long.	Shepherd's do Siberian. Pomeranian. Icelandish, &c.
Muzzle less acute; ears sub-erect; hair short or wiry.	Terrier, rough and smooth. Turnspit. Barbary dog. Lurcher, &c.
Ears moderate, narrow, generally pendulous; muzzle produced.	Great Danish dog. Irish wolf-dog. Scotch greyhound, or deer-hound. English ditto. Italian ditto. Persian ditto. Albanian dog, &c.
Ears moderately large, pendent; muzzle moderate; hair long.	Spaniel. Water-spaniel. Rough water-dog. Setter, &c.
Ears moderately large and pendent; muzzle deep and strong; hair long or wiry.	Italian wolf-dog. Newfoundland-dog. Labrador dog. Alpine dog, &c.
Ears large and pendent; muzzle long and deep; nose large; hair close.	Pointer. Beagle. Harrier. Fox-hound. Old English hound. Bloodhound. African hound, &c.
Ears moderate, pendent; muzzle short and thick; hair short.	Cuban mastiff. Mastiff. Ban-dog. Bulldog. Corsican bulldog, &c. Pug-dog?

This, and every other attempt to arrange the various breeds of dogs under different heads, must necessarily be defective, from that want of information which we are now doomed to deplore regarding the races of antiquity. Were we possessed of this knowledge to the extent which is generally desired, how much light would be thrown on our modern varieties! We know, indeed, that the Greeks and Romans had valuable dogs for hunting various wild animals; we also know that they paid great attention to their training; but, beyond this, we know little. They had watch-dogs, hounds, a greyhound breed, and probably a breed of spaniels, the *Canis Tuscus*, also described as *Proles de sanguine Ibero*. There is a dog represented on a mosaic pavement at Pompeii, fastened by a chain, with the caution "*Cave canem*," "Beware the dog," written at its feet. A representation of this is to be seen in some histories of Roman antiquities. The small sharp ears and elongated muzzle give it a wild aspect: it appears to be a strongly-made, vigorous animal; but if it represent the *Dogue de forte* race of the Romans, it is not to be wondered at their sending to Britain for our old indigenous mastiff.

In the Scriptures there are abundant allusions to the dog. Some of these are to be found in Exodus xxii. 31; 1 Kings xxi. 19 and 23; 2 Kings ix. 35, and elsewhere. The passages of greatest force are:—"In the place where the dogs licked the blood of Naboth, shall dogs lick thy blood, even thine;" and, "The dogs shall eat Jezebel by the wall of Jezreel." These recall the picture of a scene painted in modern days by a poet, who had travelled in Greece and Turkey, and whose wonderful pen drew, with magical power, the habits of the masterless dogs that "wander up and down for meat, and grudge if they be not satisfied." The passage is in Byron's *Siege of Corinth*:—

"He saw the lean dogs beneath the wall,
Hold o'er the dead their carnival;
Gorging and growling o'er carcass and limb,
They were too busy to bark at him.
From a Tartar's skull they had stripp'd the flesh,
As ye peel the fig when the fruit is fresh;
And their white tusks crunch'd o'er the whiter skull,
As it slipt through their jaws when their edge grew dull,
As they lazily mumbled the bones of the dead,
As they scarce could rise from the spot where they fed;
So well had they broken a lingering fast
With those who had fallen for that night's repast."

In Egypt the dog was a favourite, and carefully bred, and, as the paintings of that people prove, there were several breeds. It would

appear, indeed, that some kinds were regarded with religious veneration, and embalmed after death. Mummies of them are still found. There would seem to have been in this country of natural and artificial physical wonders, different kinds of dogs. There are representations of hounds resembling our greyhound; of pet-domestic dogs, with sharp ears, and curly tails; of short-legged turnspits; of watch-dogs; of hunting-dogs, and other descriptions of the canine race. Indeed, what, physically speaking, were this people without, from the Pyramid of Cheops down to the smallest representations of humanity, in black marble statuary?—from innumerable colossal figures of kings that might rival the proportions of Jupiter in our limited conceptions, down to the minutest representation of the species—*scaribaes*—that human ingenuity and fingers could fashion? They had, also, of "live-stock," the crocodile, "the great dragon of the river," the emblem of the Nile, and the symbol of Egypt; they had the beautiful ibis and the pelican, emblem of maternal love; in short, what had they not? and, as they represented these things in sculpture, so did they represent their dogs, from which representations we are, at this day, enabled to decide, in some measure, the nature of the various breeds of the animals of which they were possessed. The modern greyhound of Arabia so closely resembles the delineations of the ancient greyhound, that we cannot doubt their affinity. The Egyptians, in the chase, used the bow and spear, and intercepted the game as it fled before the hounds, discharging their arrows whenever it came within range. When a fierce antelope, as the Leucoryx, was brought to bay, the hunter gallantly used his spear, as the boar-hunter of the middle ages did in Europe. On the level plains of Egypt the *chasseur* often followed in his chariot, urging his horses to the full speed, and endeavouring to meet the game, or place himself in the direction the dogs were forcing it to take, with his bow and arrows ready. It was, perhaps, the partiality evinced by the Egyptians for the dog, that led the Israelites to regard it with abhorrence, as an unclean animal; in which feeling they have been followed by the Mohammedans. Be this as it may, Palestine "is the country in which this animal has the longest been refused that entire domestication with man which he has enjoyed in most other lands; in other words, the treatment of the dog has almost always, in Palestine, been such as it has only in other countries been subject to, since the propagation of the Moslem faith. And since the ideas concerning dogs have been much the same with the ancient Jews and modern Moslems, there is no doubt that the existing practices of the latter, illustrate the ancient practices of the former. Among both, we trace the despised, but not maltreated dog of the streets; and among both we discover that, with every predisposition to do without them, certain breeds of dogs have forced their services upon man, from the indispensable nature of their help in hunting and in guarding the flocks."

The street dogs, called Pariah dogs in India, have excited the attention of all travellers in that country, as well as in Turkey, and the whole of the Levant. They roam the streets of towns, cities, and villages, owned by no one; but, for their services in clearing away carrion and offal, are universally tolerated. Allusions are made to them in the earliest records of antiquity. Homer describes them in conjunction with vultures, as feeding upon the slain:—

> "Whose limbs, unburied on the naked shore,
> Devouring dogs and hungry vultures tore."

These dogs herd together in troops, and keep to their respective districts; they display all the qualities and propensities of their race, and if they are fierce and ravenous, it is because they are left to their own resources; since, to become at once domestic, they require only to be owned and noticed. Colonel Sykes, speaking of the Pariah dog of Dukhun, observes that it is there very numerous, and not individual property, but breeds in the towns and villages unmolested. He remarks that the Turnspit dog, long-backed, with short crooked legs, is frequently found among the Pariahs. There is also a petted minute variety of the Pariah dog, usually of a white colour, with long silky hair, corresponding to a common lap-dog of Europe, which is taught to carry flambeaux and lanterns. The last variety noticed, is the dog with hair so short as to appear naked, like the Barbary or Egyptian dog. It is known to Europeans by the name of the Polygar dog. Of the *Domesticated*

dogs, Colonel Sykes states, that the first in size and strength is the Brinjaree dog, which somewhat resembles the Persian greyhound, but is much more powerful.

The properties of the dog, however, will be treated of further on in this work; meanwhile we will here instance the general intelligence, fidelity, and sagacity of this animal, by a few illustrative anecdotes, which place him in his relationship with man in a striking point of view. There are few who, from their own experience, cannot bear testimony to the good qualities of the dog! It has been somewhere said, "that man is the god of the dog," for to man he looks up with reverence and affection, and the praise of his master is his richest reward. Is this instinctive attachment to the human species acquired, or is it an original impulse implanted in its nature, by the All-wise Creator, for man's benefit, so that in the primitive condition of society he might have a friend and assistant, all-important in the chase, and in the extirpation of wild beasts, which, ere he can settle in a land or found a colony, he must drive to a distance or destroy?

In reference to the domesticated races, we have no animal so completely subservient to all the purposes or the wants of man, in so far as obedience, attachment, and alliance can be rendered by an inferior to a superior. The anecdotes which are recorded as illustrative of these qualities, would form a canine library of no mean pretensions. In Mr. Burchell's *Travels in Africa*, we have the character of a pack of dogs thus given:—

"Our pack of dogs consisted of five-and-twenty of various sorts and sizes. This variety, though not altogether intentional, as I was obliged to take any that could be procured, was of the greatest service in such an expedition, as I observed that some gave notice of danger in one way, and others in another. Some were more disposed to watch against men, and others against wild beasts; some discovered an enemy by their quickness of hearing, others by that of scent; some for speed in pursuing game; some were useful only for their vigilance and barking; and others for their courage in holding ferocious animals at bay. So large a pack was not, indeed, maintained without adding greatly to our care and trouble, in supplying them with meat and water, for it was sometimes difficult to procure for them enough of the latter; but their services were invaluable, often contributing to our safety, and always to our ease, by their constant vigilance, as we felt a confidence that no danger could approach us at night without being announced by their barking. No circumstances could render the value and fidelity of these animals so conspicuous and sensible as a journey through regions which, abounding in wild beasts of almost every class, gave continual opportunities of witnessing the strong contrast in their habits, between the ferocious beasts of prey, which fly at the approach of man, and these kind, but too often injured companions of the human race. Many times, when we have been travelling over the plains where those have fled the moment we appeared in sight, have I turned my eyes towards my dogs to admire their attachment, and have felt a grateful affection towards them for preferring our society to the liberty of other quadrupeds. Often, in the middle of the night, when all my people have been fast asleep around the fire, have I stood to contemplate these faithful animals lying by their side, and have learnt to esteem them for their social love of mankind. When wandering over pathless deserts, oppressed with vexation and distress at the conduct of my own men, I have turned to these as my only friends, and felt how much inferior to them was man when actuated only by selfish views.

"The familiarity which subsists between this animal and our own race, is so common to almost every country of the globe, that any remark upon it must seem superfluous; but I cannot avoid believing that it is the universality of the fact which prevents the greater part of mankind from reflecting duly on the subject. While almost every other quadruped fears man as its most formidable enemy, here is one which regards him as its companion, and follows him as its friend. We must not mistake the nature of the case; it is not because we train him to our use; and have made choice of him in preference to other animals, but because this particular species feels a natural desire to be useful to man, and from spontaneous impulse attaches itself to him. Were it not so, we should see, in various

countries, an equal familiarity with various other quadrupeds, according to the habits, the taste, or the caprice of different nations. But everywhere it is the dog only that takes delight in associating with us, in sharing our abode, and is even jealous that our attention should be bestowed on him alone; it is he who knows us personally, watches for us, and warns us of danger. It is impossible for the naturalist, when taking a survey of the whole animal creation, not to feel a conviction that this friendship between two creatures so different from each other, must be the result of the laws of nature; nor can the humane and feeling mind avoid the belief, that kindness to those animals, from which he derives continual and essential assistance, is part of his moral duty."

These sentiments are those of a man who was everywhere surrounded with danger, and who was in the very best situation for appreciating the nature and value of the dog. He saw in him the most constant, vigilant, and faithful of associates; his humanity expanded as he reflected on his qualities, and he could not help giving the preference to the dog over his own species for faithfulness and friendship. The passage in which this appears is worth repeating and remembering by those who may look upon this generous animal with an unfavourable or unfriendly eye. "When wandering over pathless deserts, oppressed with vexation and distress at the conduct of *my own men*, I have turned to these as *my own friends*, and felt how much inferior to them was man when actuated only by selfish views."

The Newfoundland dog has long been famous for his sagacity and the humanity of his performances.

A native of Germany, fond of travelling, was pursuing his course through Holland, accompanied by a very large one of this species. Walking one evening on a high bank, which formed one side of a dike, or canal, so common in that country, his foot slipped, and he was precipitated into the water, and, being unable to swim, he soon became senseless. When he recovered his recollection, he found himself in a cottage on the opposite side of the dike to that from which he had fallen, surrounded by peasants, who had been using the means so generally practised in that country for restoring animation. The account given by the peasants was, that one of them, returning home from his labour, observed, at a considerable distance, a large dog in the water, swimming, and dragging, and sometimes pushing something which he seemed to have great difficulty in supporting, but which he, at length, succeeded in getting into a small creek on the opposite side to that on which the men were.

When the animal had pulled what he had hitherto supported as far out of the water as he was able, the peasant discovered that it was the body of a man. The dog having shaken himself, began industriously to lick the hands and face of his master, while the rustic hastened across; and, having obtained assistance, the body was conveyed to a neighbouring house, where the usual means of resuscitation soon restored him to sense and recollection. Two very considerable bruises, with the marks of teeth, appeared—one on the shoulder, the other on the nape of the neck—whence it was presumed that the faithful animal first seized his master by the shoulder, and swam with him in this manner for some time; but that his sagacity had prompted him to let go his hold, and shift his grasp to the neck, by which he had been enabled to support the head out of the water. It was in the latter position that the peasant observed the dog making his way along the dike, which, it appeared, he had done for a distance of nearly a quarter of a mile. It is therefore probable that this gentleman owed his life as much to the sagacity as to the fidelity of his dog.

A large Newfoundland dog, belonging to Glasgow, offers another instance to the many on record of the extraordinary sagacity of dogs. It seems, that being, like human juveniles, sometimes rather fond of fun, he required to receive occasional discipline, and for that purpose a whip-shaft was kept beside him, which was at certain times applied to him. He evidently did not like this article, and was found occasionally with it in his teeth, moving slily to the door with it. Being left at night on the premises, he found the hated article, and thrust the small end below the door, but this he could not do with the thick part. A few nights afterwards, the whip-shaft was left beside him, and was never seen again. He

had put the small end below the door, and some one had pulled it out. On the dog being asked where it was, he looked very guilty, and slunk away with his tail between his legs. This same dog has his provisions brought to him in a tin can. Taking a walk, he saw a child carrying a vessel exceedingly like his; when he quietly seized it by the handle, and carried it to his quarters, the child holding on, and screaming all the way. When shown his own he seemed quite ashamed of his mistake, and allowed the frightened child to go with the tin he had mistaken for his own. This animal is in the habit of begging money from his biped acquaintance, with which he marches to a baker's shop and buys bread, which he carries home and eats when hungry.

It was but the other day that we read of an anecdote strongly indicative of the fidelity of an Irish dog towards his master, who, in the city of Dublin, was overcome by the potent beverage which, as it is a favourite liquor of other parts of Ireland, so does it hold a high place in the estimation of at least some of the inhabitants of that city. A respectable-looking man, belonging to the middle classes of life, tottered down Donegal-street, apparently oblivious to everything. A handsome dog, of the caste known as spaniel, followed at his heels, whining most mournfully, evidently wishing him to retrace his steps, and displaying a great deal more regard for the man than he did for himself. The man at last tumbled down on the steps opposite the parish church, his watch being thrown out of his pocket by the fall. The dog, with an instinct which, if inferior to the reason exhibited in a higher order of beings, certainly exhibited a more exalted notion of affection than is portrayed in many, lay down on his master's breast, clutching the watch between his two fore feet. A crowd gathered round the senseless man; but the dog, considering himself his protector, would let no one approach him. A constable came up; but the dumb animal, recognising no person, would not let the policeman go near him, the dog guarding every poke of the baton with his head. The barking of the spaniel at last awakened the drunkard, who, with much difficulty, got the watch into his pocket, and staggered on, the faithful animal barking and wagging his tail with delight.

There is, perhaps, a still more extraordinary instance of sagacity; and, as it is of a rare description, it merits a place in these pages. It is from the *Recollections of a Sportsman*, by Lord W. Lennox. "A short time ago, a dog, well known to the railway officials, from his frequent travelling with his master, presented himself at one of the stations on the Fleetwood, Preston, and Longridge line. After looking round for some length of time among the passengers, and in the carriages, just as the train was about to start he leaped into one of the compartments of a carriage, and laid himself down under the seat. Arriving at Longridge, he made another survey of the passengers, and, after waiting until the station had been cleared, he went into the railway station hotel, searched all the places on the ground-floor, then went and made a tour of inspection over the adjoining grounds; but, being apparently unsuccessful, trotted back to the train, and took his old position just as it moved off. On reaching the station from which he had first started, he again looked round as before, and took his departure. It seems that he now proceeded to the general railway station at Preston, and, after repeating the looking-around performance, placed himself under one of the seats in a train which he had singled out of many that are constantly passing in and out, and, in due time, arrived in Liverpool. He now visited a few places where he had been before with his master, of whom, as it afterwards appeared, he was in search. Of his adventures in Liverpool little is known; but he remained all night, and visited Preston again early the next morning. Still, not finding his missing master, he, for the fourth time, "took the train"—this time, however, to Lancaster and Carlisle; at which latter place the sagacity and faithfulness of the animal, as well as the perseverance and tact he displayed in prosecuting his search, were rewarded by finding his master."

Of the spaniel races there are many recorded instances of wonderful sagacity; and to some of them has been ascribed the possession of even an organ of music. On a few of this family, fine music has been known to produce an apparently painful effect, causing them gradually to become restless, to moan piteously, and, finally, to escape from its presence with every sign of

suffering and distress. Others have been seen to sit and listen to music with seeming delight, and even to go every Sunday to church, with the obvious purpose of enjoying the solemn and powerful strains of the organ. All these displays, however, of musical tendencies on the part of the canine race, are as nothing in comparison with the following, which a German paper gave an account of some time back. Frederick S——, a musical amateur of Darmstadt, in the grand duchy of Hesse, possesses a female spaniel, which has become a strange source of terror to all the mediocre musicians of the place and its vicinity. Having acquired a competency by commercial industry, Mr. S——retired from business, and devoted himself, heart and soul, to the daily and hourly enjoyment of his favourite science. Every member of his little household was by degrees involved, more or less, in the same occupation, and even the housemaid could, in time, take a part in a chorus. One individual alone in the family seemed to resist this musical entrancement; this was a small spaniel, the sole specimen of the canine race in the mansion. Mr. S——felt the impossibility of instilling the theory of sounds into the head of Poodle, but he firmly resolved to make the animal bear *some* part or other in the general domestic concert; and by perseverance, and the adoption of ingenious means, he attained his object. Every time that a *false note* escaped either from instrument or voice—as often as any blunder, of whatever kind, was committed by the members of the musical family (and such blunders were sometimes committed intentionally)—down came its master's cane on the back of the unfortunate spaniel, till she howled and growled again. By-and-by, simple menaces with the stick were substituted for blows; and, at a still more advanced period of this extraordinary training, a mere glance of Mr. S——'s eye was sufficient to make the animal howl to admiration. In the end, she became so thoroughly acquainted with, and attentive to, false notes, and other musical barbarisms, that the slightest mistake of the kind was infallibly signalised by a yell from her, forming the most expressive commentary upon the misperformance. When extended trials were made of the animal's acquirements, they were never found to fail, and she became, what she still is, the most famous, impartial, and conscientious critic in the duchy of Hesse. But, as may be imagined, her musical appreciation is entirely negative: if you sing with expression, and play with ability, she will remain cold and impassible. Although nothing can be said in favour of the dog while in a state of nature, still, after he has received an education from man, the whole world will bear testimony to his immense value. Volumes would not suffice to contain instances of his services to the human race. A man and his dog may almost be considered as component parts, each working for the other, whether in heat or in cold, in tempests or in calms. The blind confide in him; the lame have his support; the rich are proud of him; and, too often, the poor man has nothing but his dog to give him consolation.

These instances of sagacity and intelligence, as displayed in this animal, are, in numberless instances, equalled by his courage. Mr. Lloyd, in his *Field Sports*, says, that "for bear-shooting, a first-rate dog is invaluable; but such are rarely to be found; indeed, with the exception of Paijas, I never met with one at all deserving of that character. That gallant hound, however, was, in his better days, everything I could wish. In one instance I knew him to worry a large bear for nearly eight successive hours; and during a considerable part of this time no person was with him. Sometimes he was alongside the beast; at others, a little ahead, and then hanging on his rear; and all this while making the forest ring again with his yells. Though he usually conducted his attacks with caution, in consequence of the mauling he received from a bear in his younger days, his courage at times, during the chase I speak of, got the better of his prudence; for, on hearing my shots, he seldom resisted the temptation of having a snap at the haunches of his rugged antagonist. In this case, the bear would swing himself round with wonderful agility, dash at the dog, and strike out with his paws in much the same manner as a cat; but Paijas, being up to these manœuvres, always took care to beat a timely retreat.

"By a dog thus incessantly harassing a bear, the sportsman is enabled to make many a short cut; his continual attacks, besides, often bring the beast to a stand-still; in which

case, one can generally approach within range of him. On such occasions a good dog is an immense safeguard to a person; as, should he unhappily fall into the jaws of the beast, his faithful follower might be the means of saving his life; for the dog seldom hesitates to fix at once upon the bear; and, by so doing, he often succeeds in drawing the attack from his master to himself.

"High-couraged dogs are not unfrequently killed by the bear during the chase; for, if the beast once gets them within his grasp, he, in most cases, quickly annihilates them. Several instances of the kind have come to my knowledge.

"It is said, that when the bear is pursued by dogs, he, at times, becomes so much enraged, that he takes hold of the nearest stick or stone he can lay his paws upon, and casts it at them. According to Mr. Nillsson, indeed, when the bear is attacked by the hunter, and whilst beating a retreat, he satisfies himself by throwing these missiles at his adversary. It is reported that bruin is a bad marksman; for, instead of sending his weapon in the direction of his opponent, he not unfrequently whizzes it over his own head. As I never witnessed an exploit of the kind on the part of a bear, I am by no means inclined to vouch for the truth of these stories."

In following the elk, the Northern chasseur must have his dogs, which he often slips from the couplings, and which not unfrequently bring the old males to bay. In hunting this animal, considerable art is necessary; and the eagerness and length of time with which they pursue the game are astonishing. The dog must always be allowed to start the elk; for, should the latter once get sight or scent of the sportsman, he usually goes off at his best pace.

The great inconvenience of slipping a dog on these occasions is, that if he should be good for anything, and the elk does not stand to bay, he will hardly ever desist from pursuing the animal; and thus the sportsman may be thrown out altogether.

To guard against a circumstance of this kind happening, the Northern chasseurs—there generally being two or more in company on these occasions—are not unfrequently provided with a second dog, which they retain in his leash. When, therefore, they can no longer hear the challenges of the dog that is loosed in the distance, the other enables them to continue the pursuit. Sometimes, however, dogs go off altogether from their masters. "I have heard of instances of their pursuing the elk such great distances, that they have been lost to their owners for days and days together, and have perhaps cast up at last in an altogether different part of the country."

Of the determination and spirit of the dog, even in pursuing and attacking the most ferocious animals, there are many examples on record. Recently, a French journal chronicled the following incidents in a wild boar hunt:—The pack of hounds of M. Rattier de Verveines, twenty-five in number, lately hunted a huge wild boar in the forest near this town—Alençon—but, after three hours' chase, could not bring it to bay, though it stopped now and then to attack the dogs. Twelve fresh hounds having been set on, it at last stopped, and the dogs attacked it with great determination. It, however, ripped up several, and threw others in the air. One of the keepers having arrived, fired his carbine, but only broke one of the fore feet of the animal. The chief keeper then arrived, and fired two balls at its head, without, however, producing any effect. He, however, re-loaded, and then lodged one ball in the boar's muzzle, and the other behind his ear. The last proved mortal, the animal falling dead. It was then found that two of the dogs were dead, ten more mortally wounded, and that several others were more or less injured. The boar weighed about 3 cwt.

The terrier has long been famous for his game and hunting propensities. Recently a stone-cutter, engaged at the Bodelwyddan church, near St. Asaph, was taking a walk in some fields, accompanied by a dog, of the cross-bred terrier breed. The dog was hunting along a small rivulet, which ran at the bottom of a field, when a large male otter made his appearance, running along the course of the brook. The man was frightened, never having seen such an animal before; but the dog immediately attacked him, when a battle ensued, the otter dragging the dog to a small pool, about three or four feet deep, evidently with the intention of drowning him. The man prevented this by laying hold of the dog, and dragged

them both out fastened together; when again, on *terra firma*, they fought desperately for half-an-hour, mutually separating to draw breath; then the otter took advantage of this pause, and made for the brook again. The dog, by this time, was dreadfully lacerated—his nose and lips cut through, and otherwise bruised. The man perceiving this, took up a hedge-stake, and gave the otter a severe blow on the head. The dog then went at him again, the man occasionally assisting with his stick; and between them both the otter was killed, after an hour's hard fighting. It was a formidable-looking animal, and measured, from the nose to the tail, 3ft. 10in.

It is to be regretted that an animal possessed of such generous impulses, however, is sometimes found to act contrary to all expectation. The following is an instance of this, and places the mastiff, on this occasion, in a very unfavourable point of view:—A lady, of some property, residing in the Rue des Vignes, at Vaugirard, was possessed of a huge mastiff, which, being very savage, had to be kept constantly chained up, but which she prized because it had belonged to her late husband. One morning, according to custom, she took the animal his food, but he seemed more indocile than usual, and she gave him a beating. Watching an opportunity, he suddenly rushed on her, threw her down, dragged off the greater part of her clothes, and bit her dreadfully in the breast, arm, and one of the legs; in fact, tearing away fragments of the flesh. The lady's cries attracted some of the neighbours to the spot, and they rescued her. Although suffering dreadfully, and faint from loss of blood, she requested them to strangle the animal. They accordingly passed a cord round the dog's neck, and removing his collar, prepared to effect the operation; but he tugged so violently at the cord that he broke it, and rushed towards the room into which the lady had been conveyed. The door was closed on him, and he tried to force it open, but failed. On this, barking furiously, he rushed towards the people, who remained in the court-yard; but they were able to escape by the door, and to close it. The commissary of police, who had been sent for, now arrived, accompanied by some *gendarmes*, and he made them kill the animal. Medical assistance having been obtained for the unfortunate lady, it was found that she was in a fearful state. The dog was, after death, examined by a veterinary surgeon, and he declared that he was neither mad nor labouring under any malady. He further declared that, in his belief, the animal must have had a sort of instinctive hatred of his mistress, and must have been driven to fury by her beating him.

Mr. Richardson gives the following interesting account of a Newfoundland dog, which belonged to a gentleman in Fifeshire, and which was alike remarkable for its tractability and its trustworthiness. At two other points, distant about a mile from each other, and at the same distance from this gentleman's mansion, there were two other dogs, of great power, but of less tractable breeds than the Newfoundland. One of these was a large mastiff, kept as a watch-dog, by a farmer; and the other a staunch bulldog, that kept guard over the parish mill. As each of these three was lord-ascendant of all animals at his master's residence, they all had a good deal of aristocratic pride and pugnacity; so that two of them seldom met without attempting to settle their respective dignities by a wager of battle.

The Newfoundland was of some service in other domestic arrangements, besides his guardianship of the house; for every forenoon he was sent to the baker's shop in the village, about half a mile distant, with a towel containing money in the corner, and he returned with the value of the money in bread. There were many useless and not over-civil curs in the village; but, on ordinary occasions, the haughty Newfoundland treated this ignoble race in that contemptuous style in which great dogs are wont to treat little ones. When the dog returned from the baker's shop he used to be regularly served with his dinner, and he went peaceably on house-duty for the rest of the day.

One day, however, he returned with his coat dirtied, and his ears scratched; having been subjected to a combined attack of the curs, while he had charge of his towel and bread, and could not defend himself. Instead of waiting for his dinner as usual, he laid down his charge somewhat sulkily, and marched off; and, upon looking after him, it was observed that he was crossing the intervening hollow in a straight line for the house of the farmer, or

rather on an embassy to the farmer's mastiff. The farmer's people observed this unusual visit; and they were induced to notice it from its being a meeting of peace between those who had habitually been belligerents. After some intercourse, of which no interpretation could be given, the two set off together in the direction of the mill; and, having arrived there, they, in brief space, engaged the miller's bull-dog as an ally.

The straight road to the village where the indignity had been offered to the Newfoundland dog, passed immediately in front of that dog's master's house; but there was a more private and circuitous road by the back of the mill. The three took this road, reached the village, scoured it in great wrath, putting to the tooth every cur they could get sight of; and having taken their revenge, and washed themselves in a ditch, they returned, each dog to the abode of his master; and when any two of them happened to meet afterwards, they displayed the same pugnacity as they had done previous to this joint expedition.

It would seem that in this case there was a mere momentary concert for the accomplishment of one object among three dogs differing considerably in their habits; and that when this momentary purpose was accomplished, the wonted animosity of the three returned, and they fought as readily with each other as ever. But it does not appear that all casual, or apparently casual, interferences of dogs, for the benefit of each other, pass off in this momentary way; for there is another well-authenticated anecdote of two dogs, at Donaghadee, in which the instinctive daring of the one on behalf of the other, caused a friendship, and, as it would seem, a kind of mourning for the dead, after one of them had paid the debt of nature. This happened while the government harbour, or pier, for the packets at Donaghadee was in the course of building, and it occurred in the sight of several witnesses. The one dog in this case also was a Newfoundland, and the other was a mastiff. They were both powerful dogs; and, though each was good-natured, when alone, they were very much in the habit of fighting when they met. One day they had a fierce and prolonged battle on the pier, from the point of which they both fell into the sea; and, as the pier was long and steep, they had no means of escape but by swimming a considerable distance. Throwing water upon fighting-dogs is an approved means of putting an end to their hostilities; and it is natural to suppose that the same effect would take place from two combatants of the same species tumbling themselves into the sea. Accordingly, each began to make for the land as he best could. The Newfoundland, being an excellent swimmer, very speedily gained the pier, on which he stood shaking himself; but, at the same time, watching the motions of his former antagonist, which, being no swimmer, was struggling exhausted in the water, and just about to sink. In dashed the Newfoundland dog, took the other gently by the collar, kept his head above water, and brought him safely on shore. There was a peculiar kind of recognition between the two animals after this. They never fought again; they were always together; and when the Newfoundland dog was accidentally killed by the passage of a stone waggon over him, the other languished, and evidently lamented for a long time.

The care of the dog in directing the steps of the blind, is highly deserving of notice. There are few persons who have not seen some of these unfortunate objects thus guided along through the winding streets of a town or city, to the spot where they are to supplicate charity of passengers. In the evening the dog safely conducts his master back, and receives, as the reward of its services, that scanty pittance which wretchedness can bestow. Mr. Ray, in his *Synopsis of Quadrupeds*, informs us of a blind beggar who was thus led through the streets of Rome by a middle-sized dog, which, besides leading his master in such a manner as to protect him from all danger, learned to distinguish both the streets and houses where he was accustomed to receive alms twice or thrice a week. Whenever the animal came to any one of these streets, with which he was well acquainted, he would not leave it till a call had been made at every house where his master was usually successful in his petitions. When the beggar began to ask alms, the dog lay down to rest; but the man was no sooner served or refused, than the dog rose spontaneously, and without either order or sign, proceeded to the other houses where the beggar generally received some gratuity. "I

observed," says he, "not without pleasure and surprise, that when a halfpenny was thrown from a window, such were the sagacity and the attention of this dog, that he went about in quest of it, took it from the ground with his mouth, and put it into the blind man's hat. Even when bread was thrown down, the animal would not taste it unless he received it from the hand of his master."

Dogs can be taught to go to market with money, to repair to a known shop, and carry home provisions in safety. Daniel speaks of a person who lived at a turnpike-house about a mile from Stratford-on-Avon, who had a dog trained to go to a neighbouring town for any articles of grocery that he wanted. A note mentioning these was tied round his neck, and in the same manner the articles were fastened. In these errands the commodities were always brought safe to his master.

Smellie, whom Lord Brougham compliments in his admirable work on *Instinct and Science*, tells us, in his *Philosophy of Natural History*, that a grocer in Edinburgh had a dog, which, for some time, amused and astonished the people in the neighbourhood. A man who went through the streets ringing a bell and selling penny pies, happened one day to treat this dog with a pie. The next time he heard the pieman's bell he ran to him with impetuosity, seized him by the coat, and would not suffer him to pass. The pieman, who understood what the animal wanted, showed him a penny, and pointed to his master, who stood at the street-door, and saw what was going on. The dog immediately supplicated his master by many humble gestures and looks. The master put a penny into the dog's mouth, which he instantly delivered to the pieman, and received his pie. This traffic between the pieman and the grocer's dog continued to be daily practised for many months.

On the authority of Dibdin, we quote the following from his *Observations in a Tour through England*. At a convent in France, twenty paupers were served with a dinner at a certain hour every day. A dog belonging to the convent did not fail to be present at this regale, to receive the odds and ends which were now and then thrown down to him. The guests, however, were poor and hungry, and, of course, not very wasteful: so that their pensioner did little more than scent the feast of which he would fain have partaken. The portions were served by a person, at the ringing of a bell, and delivered out by means of what, in religious houses, is called a *tour;* which is a machine like the section of a cask, that, by turning round upon a pivot, exhibits whatever is placed on the concave side, without discovering the person who moves it. One day this dog, who had only received a few scraps, waited till the paupers were all gone, took the rope in his mouth, and rang the bell. His stratagem succeeded. He repeated it the next day with the same good fortune. At length the cook, finding that twenty-one portions were given out instead of twenty, was determined to discover the trick: in doing which he had no great difficulty; for, lying *perdu*, and noticing the paupers as they came in great regularity for their different portions, and that there was no intruder except the dog, he began to suspect the real truth; which he was confirmed in when he saw him wait with great deliberation till the visitors were all gone, and then pull the bell. The matter was related to the community; and, to reward him for his ingenuity, he was permitted to ring the bell every day for his dinner, when a mess of broken victuals was purposely served out to him.

In Vol. III. of the *Annual Register*, we find it stated, that "while a man of the name of Richardson, a waterman, near Hammersmith, was sleeping in his vessel, she broke from her moorings, and was carried by the tide under a west-country barge. Fortunately for the man, his dog happened to be with him; and the sagacious animal awakened him by pawing his face, and pulling the collar of his coat, at the instant the boat was filling with water. He seized the opportunity, and thus saved himself from otherwise inevitable death."

About the end of the last century, a person went to a house in Deptford, to take lodgings, under pretence that he had just arrived from the West Indies. After having agreed on the terms he was to pay, he said he should send his trunk that night, and come himself the next day. About nine o'clock in the evening, the trunk was brought by two porters, and was carried into his bed-room. Just as the family were going to bed, their little house-

dog, deserting his usual station in the shop, placed himself close to the chamber-door where the chest was deposited, and kept up an incessant barking. The moment the chamber-door was opened, the dog flew to the chest, against which it scratched and barked with redoubled fury. They attempted to get the animal out of the room, but in vain. Calling in some neighbours, and making them eye-witnesses of the circumstance, they began to move the trunk about; when they immediately discovered that it contained something that was alive. Suspicion becoming very strong, they were induced to force it open; when, to their utter astonishment, they found in it their new lodger, who had had himself thus conveyed into the house with the intention of robbing it.

In the *Life of James Sackington*, it is stated that Mr. C. Hughes, a son of Thespis, had a wig which generally hung on a peg in one of his rooms. He one day lent the wig to a brother player, and, some time after, called on him. Mr. Hughes had his dog with him, and the man happened to have the borrowed wig on his head. Mr. Hughes stayed a little while with his friend; but, when he left him, the dog remained behind; for some time he stood, looking full in the man's face; then making a sudden spring, leaped on his shoulders, seized the wig, and ran off with it as fast as he could; and, when he reached home, he endeavoured, by jumping, to hang it up in its usual place. The same dog was one afternoon passing through a field in the environs of Dartmouth, where a washerwoman had hung out her linen to dry. He stopped, and surveyed one particular shirt with attention; then seizing it, he dragged it away through the dirt to his master, whose shirt it proved to be.

Some nations are partial to the dog as food. In some of the South Sea islands dogs are fattened with vegetables, which the natives savagely cram down their throats when they will voluntarily eat no more. They become exceedingly fat; and are allowed, by Europeans who have overcome their prejudices, to be very palatable. They are killed by strangling; and the extravasated blood is preserved in cocoa-nut shells, and baked for the table. The negroes of the coast of Guinea are so partial to these animals as food, that they frequently give considerable prices for them: a large sheep for a dog was, at one time, a common article of exchange. Even the ancients esteemed a young and fat dog to be excellent eating. Hippocrates ranks it with mutton or pork. The Romans admired sucking whelps, esteeming them a supper in which even the gods delighted.

When Lieutenant Fremont was at Fort Lamarie, on the Platte—a station of the American Fur Company—the Indians in the neighbourhood gave him an invitation to a feast of honour—a dog feast. "The women and children," says the lieutenant, "were sitting outside the lodge, and we took our seats on buffalo robes spread around. The dog was in a large pot over the fire, in the middle of the lodge, and, immediately on our arrival, was dished up in large wooden bowls, one of which was handed to each. The flesh appeared very glutinous, with something of the flavour and appearance of mutton. Feeling something move behind me, I looked round, and found that I had taken my seat among a litter of fat young puppies. Had I been nice in such matters, the prejudices of civilisation might have interfered with my tranquillity; but, fortunately, I am not of delicate nerves, and continued quietly to empty my platter."

Buffon has bequeathed us an excellent description of the dog, the substance of which is here given.

"The dog," he says, "independently of the beauty of his form, his vivacity, force, and swiftness, is possessed of all those internal qualifications that can conciliate the affections of man, and make the tyrant a protector. A natural share of courage, an angry and ferocious disposition, renders the dog, in its savage state, a formidable enemy to all other animals: but these readily give way to very different qualities in the domestic dog, whose only ambition seems to please: he is seen to come crouching along, to lay his force, his courage, and all his useful talents at the feet of his master; he waits his orders, to which he pays implicit obedience; he consults his looks, and a single glance is sufficient to put him in motion; he is more faithful even than the most boasted among men; he is constant in his affections, friendly without interest, and grateful for the slightest favours; much more mindful of benefits received than injuries

offered, he is not driven off by unkindness; he still continues humble, submissive, and imploring; his only hope to be serviceable, his only terror to displease; he licks the hand that has been just lifted to strike him, and at last disarms resentment by submissive perseverance.

"More docile than man, more obedient than any other animal, he is not only instructed in a short time, but he also conforms to the dispositions and the manners of those who command him. He takes his tone from the house he inhabits; like the rest of the domestics, he is disdainful among the proud, and churlish among clowns. Always assiduous in serving his master, and only a friend to his friends, he is indifferent to all the rest, and declares himself openly against such as seem dependent like himself. He knows a beggar by his clothes, by his voice, or his gestures, and forbids his approach. When at night the guard of the house is committed to his care, he seems proud of the charge; he continues a watchful sentinel; he goes his rounds, scents strangers at a distance, and gives them warning of his being on duty. If they attempt to break in upon his territories, he becomes more fierce, flies at them, threatens, fights, and either conquers alone, or alarms those who have most interest in coming to his assistance. However, when he has conquered, he quickly reposes upon the spoil, and abstains from what he has deterred others from abusing; giving thus at once a lesson of courage, temperance, and fidelity.

"From hence we see of what importance this animal is to us in a state of nature. Supposing, for a moment, that this species had not existed, how could man, without the assistance of the dog, have been able to conquer, tame, and reduce to servitude every other animal? How could he discover, trace, and destroy those that were noxious to him? In order to be secure, and become master of all animated nature, it was necessary for him to begin by making a friend of part of them; to attach such of them to himself, by kindness and caresses, as seemed fittest for obedience and active pursuit. Thus the first art employed by man was in conciliating the favour of the dog; and the fruits of this art was the conquest and peaceable possession of the earth.

"The generality of animals have greater agility, greater swiftness, and more formidable arms, from nature, than man; their senses, and particularly that of smelling, are far more perfect: and having gained, therefore, a new assistant, particularly one whose scent is so exquisite as that of the dog, was the gaining a new sense, a new faculty, which before was wanting. The machines and instruments which we have imagined for perfecting the rest of the senses, do not approach to that already prepared by nature, by which we are enabled to find out every animal though unseen, and thus destroy the noxious, and use the serviceable.

"The dog, thus useful in itself, taken into a participation of empire, exerts a degree of superiority over all animals that require human protection. The flock and the herd obey his voice more readily even than that of the shepherd or the herdsman; he conducts them, guards them, keeps them from capriciously seeking danger; and their enemies he considers as his own. Nor is he less useful in the pursuit; when the sound of the horn, or the voice of the huntsman, calls him to the field, he testifies his pleasure by every little art, and pursues with perseverance those animals which, when taken, he must not expect to divide. The desire of hunting is, indeed, natural to him, as well as to his master, since war and the chase are the only employ of savages. All animals that live upon flesh hunt by nature. The lion and the tiger, whose force is so great that they are sure to conquer, hunt alone, and without art. The wolf, the fox, and the wild dog, hunt in packs, assist each other, and divide the spoil. But, when education has perfected this talent in the domestic dog—when he has been taught by man to repress his ardour, to measure his motions, and not to exhaust his force by too sudden an exertion of it, he then hunts with method, and always with success."

CHAPTER III.

VARIETIES OF THE DOG—WILD AND HALF-WILD.

If we pass from dogs confessedly wild to those which are half-wild, only semi-domesticated, the Dingo, or Australian dog, is one of the most remarkable and best known. Of the origin of this dog, and of the circumstances connected with its introduction into Australia, we are totally ignorant. We know that wild packs exist in the remoter districts, and are the scourge of the country, preying on the native kangaroo, and making havoc among the flocks and herds of the European settlers. So wolf-like are these dogs in general form—though they are specifically distinct from the wolf—that the first navigators who touched at New Holland scarcely recognised them as dogs. Dampier, in the account of his voyage performed in 1699, states that his men saw two or three beasts like hungry wolves; and the similarity is, to a certain degree, very striking. The domestic breed—if domestic it can be called—in all respects resembles those which are completely emancipated.

THE DINGO.

The Dingo, called Warragal by the natives, is about as large as a harrier; its body is firmly built, its limbs muscular; its head is broad between the ears, and its muzzle is acute; the neck is thick and powerful; the ears are short, pointed, and erect; its tail, which is rather long, is somewhat bushy and pendulous, or, at most, raised only horizontally. The general colour is sandy red; the eyes are rather small and oblique, which is one of the diagnostics of a low degree of cultivation, and is never seen in what are termed high-bred animals.

The agility and muscular powers of the Dingo are extraordinary; and its cunning and ferocity are as much so. It never barks, but howls loudly; and is said never to discover a feeling of pleasure by wagging the tail. The natural habits of one which was brought to this country in about the sixth week of its age, was closely watched. On its being put into a room, it immediately skulked into the darkest corner, and there crouching, eyed those in its presence with looks of great distrust and aversion: as soon as left to itself, it commenced the most melancholy howling, which ceased on any person's entrance. This, for some days, was its constant practice; and, when placed in a kennel, the greater part of the day was thus passed. It grew up strong and healthy, and gradually became reconciled to those from whom it was accustomed to receive food, but was shy towards others, retreating into its kennel at their approach. It never barked, nor, like other dogs, gave notice of the approach of strangers, and therefore, as a guard, was perfectly useless. A great part of the day was spent in howling, and that so loudly as to be heard at the distance of more than half a mile. When the moon rose brightly, it would sit and utter, for hours, its wild lamentations, not a little to the annoyance of the neighbourhood. With all its shyness, it was, at the same time, savage, but would never make an open attack. Several times it snapped at persons who happened to be walking within its reach, but only when their backs were turned, and it immediately retreated again into its kennel. So great was its strength, that though encumbered by a heavy chain, it leaped a wall of considerable height, and was not secured without difficulty.

This animal is a great pest to the Australian settler, and is remarkably tenacious of life. It is also a very obstinate fighter. Instances are related of its sustaining a combat with four or five stout hounds, and ultimately getting away from them. Very few dogs can kill a Dingo single-handed. Like the wolf, it fights in silence, and utters no cry of pain; but, like that grim felon, dies as hard as it has lived. The following instances of its tenacity of life are given by Mr. George Bennet, in his *Wanderings in New South Wales*:—

"One had been beaten so severely that it was supposed all its bones were broken, and it was left for dead. After the person had walked some distance, upon accidentally looking back,

his surprise was much excited by seeing the Dingo rise, shake himself, and march into the bush, evading all pursuit. One, supposed dead, was brought into a hut, for the purpose of undergoing decortication: at the commencement of the skinning process upon the face, the only perceptible movement was a slight quivering of the lips, which was regarded at the time as merely muscular irritability. The man, after skinning a very small portion, left the hut to sharpen his knife, and, on returning, found the animal sitting up, with the flayed integument hanging over on one side of the face."

In New Zealand there has been found an apparently feral dog, called by the natives "KARARAHE." Regarding this animal there is a tradition, which says, that he was given to them some centuries ago by certain divinities who visited their shores. In appearance, this dog closely resembles the "Dingo," but he seems to have been partially domesticated.

There is a small dog domesticated on the banks of the Niger, very nearly resembling the Dingo in form, but on a much more diminutive and lighter scale, and with a longer muzzle in proportion. Its general colour is reddish.

THE DHOLE.—CANIS PRIMÆVUS.

The Dhole is a native of India, over which peninsula it extends in great numbers, and bears different names in different parts. It was originally described by Mr. Hodgson as the Búánsú. and by him given the title of *Canis primævus*—original, or primeval dog—as, in his opinion, it was the origin of the domestic dog. The locality of the dog to which we have already alluded, was Nepaul, the eastern and western limits of its range being the Sutlej and the Burhampootra.

In 1831, Colonel Sykes described a wild dog from the Mahrattas, which he calls the wild dog of the Deccan; to which we have also already alluded, and which would seem to be identical with Mr. Hodgson's dog.

The Dhole, Búánsú, or Kolsun—for these names are synonymous—is about the size of a small wolf, but is much more powerfully built; its limbs, in particular, being remarkably large-boned and muscular, in proportion to its size. Its ears are large, and rounded at the tips; the muzzle moderately pointed; the tail very bushy; and its colour a sandy red, or buff.

"In habits, these dogs present all the characteristics of ferocious beasts of prey. They prowl by night and by day indiscriminately, and hunt in packs of from ten to sixty. While in pursuit they utter a peculiar yelp; and it is on scent, and not on sight, that they mainly depend for success. Their speed, however, is considerable, and their savage courage and endurance render them a terror to the most formidable rangers of the wilds. Bishop Heber says of this dog—'They are larger and stronger than the fox, which in form and fur they resemble. They hunt in packs, give tongue like dogs, and possess an exquisite scent. They make, of course, tremendous havoc among the game in these *raids;* but the mischief is said to be repaired by destroying wild beasts.' The panther, the wild bull, the tiger, the elephant, fall an easy prey before a pack of dholes. On they sweep, coming upon their game with the force of an avalanche, and overwhelming their victim in a living torrent. The hunted animal may, indeed, kill many of his enemies, but he has little time afforded him for exertion or display of prowess; for the dead or wounded are hardly missed ere others have rushed into their places.—The wild dog of China has a great resemblance to the Dhole; but is usually less in size, and its ears are smaller and more pointed; its colour is that of a lively bay."

THE DEEB OF EGYPT.

The Deeb of Egypt chiefly inhabits Abyssinia and Nubia, and is a very ancient dog. Some naturalists have considered it as the original type; but this of course is a point which it is impossible to settle. It has erect ears; semi-pendulous lips; muzzle rather blunt at the point; tail hairy and short; and its colour is that of a dirty white, intermixed with black and buff; its height is about eighteen inches.

SOUTH AMERICAN RACES.

Among the wild races of dogs, or rather of dogs become wild, to which Buffon alludes, are those of South America and the West Indian Islands, confessedly sprung from a European stock, left or lost by the early settlers in the vast plains. These have given origin to an unreclaimed race. Azara states that these dogs are

called Yagoua in Paraguay, where they are very common, and dwell in caves. They formerly abounded in Hayti, Cuba, and all the Caribbean islands; but are now extirpated there. Mr. Darwin alludes to wild dogs in Banda Oriental as attacking sheep. According to Oexmelin these dogs resemble the greyhound; but others more accurately describe them as having the head flat and elongated, the muzzle sharp, the body slender, and the general aspect wild and savage. They are strong and active, and hunt their prey in packs.

It would appear, however, that the Europeans, on their arrival, found native dogs both in the Caribbean Islands and in Peru. "Those belonging to the savages of the Antilles," says Buffon, "had the head and ears very long, and resembled a fox in appearance." He also adds that the Indians of Peru had a large and a smaller kind of dog, which they named Alco, and that those of the Isthmus were ugly, with rough, long hair, and erect ears.

With respect to the Alco of Peru and Mexico, nothing more is known about it than what Dampier and Fernandez mention. The latter describes two breeds—viz., the fat Alco, or Michuacaneus, called by the natives Ytzcuinte porzotli, and the broad-footed Alco, or Techichi. Both were small, some of the latter race not much exceeding a guinea-pig in size. The head was small, the back arched, the body thick, the ears pendulous, and the tail short. An individual, probably of this race, was brought to this country from the neighbourhood of Mexico, by Mr. Bullock; it was white, variegated with black and reddish-yellow. This specimen was procured in the mountains of Durango, where it bore the name of Acolotte It died in a few days, and its stuffed skin formed part of a collection exhibited in Piccadilly, being placed under a glass with a huge bull-frog, which equalled it in size. Dogs resembling the Alco were seen as early as 1492, in several of the West Indian Islands, by Columbus; and were also found in Martinique and Guadaloupe, in 1635, by French navigators, who describe them as resembling the little Turkish, or Barbary dogs, without hair; adding, that they were eaten by the inhabitants. All trace of them is now lost.

The probability is that these Alco dogs were not indigenes to the soil, either in the islands or on the continent of Peru; but were brought by some of the tribes by whom South America was populated. The breed might have been introduced by that strange people (of Malay descent?) who founded the Peruvian and Mexican empires. In the South Sea Islands, dogs of a similar race exist, which are fed on vegetable food, and eaten, as were the Alco dogs in South America.

AFRICAN DOGS.

Wild dogs exist in Congo, Guinea, and other parts of Africa, hunting in packs, and dwelling in caves or burrows. Clapperton met with them in the country beyond Timbuctoo. In the island of Teneriffe, a large wolfish breed of dogs is domesticated, and valued for the chase.

Major Denham used African hounds in Africa for hunting the gazelle; in the chase of which, their exquisite scent and extraordinary speed were displayed to great advantage. They would frequently quit the line of scent for the purpose of taking a direct, instead of a circuitous course—sportsmen call this cutting off a double—and recover the scent again with wonderful facility. These beautiful hounds were brought to England, and consigned to the Tower menagerie; where, shut up in a close den, they were doubtless miserable. Instead of exerting their energies in pursuit of the antelope on the plains of Africa, here they were prisoners, with no means of escape, and with no room or opportunity for the exercise of their powers and instincts. They were not, however, of a wild breed; in symmetry and action they were perfect models; and in temper were gentle, excepting that confinement rendered the female irritable.

The Cape hunting-dog is a daring and ferocious animal; and as the Dingo is in Australia, so it is one of the pests of Southern Africa. It is a complete dog, or *canis*, in the form of the skull and the characters of the teeth; it has, however, as in the hyænas, only four toes on the anterior feet, and the same on the feet behind. In figure it is tall, lightly built, but muscular and well proportioned; the limbs are long, the ears large and erect, the jaws powerful, and the teeth strong. Its aspect is wild and fierce, and its disposition treacherous. The fur is close and of a sandy yellow, irregularly

clouded and blotched with black and a little white. The tail is somewhat bushy, and of moderate length. The colour is subject to variation.

Wild, fleet and savage, this species hunts in packs mostly during the night, but frequently in the day; and so fleet is it that few animals can out-distance its speed. It often commits extensive ravages on the flocks and herds of the farmer, though it seldom attacks horned cattle openly, but steals on them while asleep, and bites off their tails, even at the root, with one snap—a feat which the wide gape and vast power of its jaws enables it to do with ease. Mr. Burchell, on his return from Africa, brought a living individual to England, which retained during life all its native ferocity.

It is the general opinion of naturalists, that this species is an intermediate link in the chain of the *carnivora*, uniting the canine group to the hyænas. Indeed, in some points of general aspect, and in the number of the toes, the approximation of this dog to the latter animals is so marked, that Mr. Burchell regarded it as a hyæna; and, as such, Temminck described it, under the title of *hyæna picta*, though he afterwards assigned it to the genus *canis*. The name of hyæna-dog has also been conferred upon it.

In size, the Cape hunting-dog (*Wilde Honden* of the Dutch colonists) is as large as a pointer or hound, but higher on the limbs in proportion to the bulk of the body. We are not aware that any serious attempts have been made to domesticate it.

ESQUIMAUX DOGS.

Dogs which, in their aspect and physiognomy, retain a marked air of wildness, as indicated by the sharpness of the muzzle, the erect or semi-erect position of the ears, and the oblique direction of the eye—giving an air of cunning and distrust to the countenance—are found in the Esquimaux race. In general aspect, this dog—*Canis familiaris, var. borealis*—so closely resembles the wolf of its native regions, that, when seen at a little distance, it is not easy to distinguish between them; so much so, indeed, is this the case, that Sir Edward Parry's party, during their second voyage, forbore to fire upon a pack of thirteen wolves, which had closely followed some Esquimaux, lest they should commit an irreparable injury upon these poor people by destroying their faithful and powerful allies.

In both the Esquimaux dog and grey wolf, the fur is deep and thick; both have the same erect ears, the same breadth of skull between them, and the same, or nearly the same, sharpness of muzzle. In addition, we may state that, in its native wilds at least, the voice of this dog is not a bark, but a long melancholy howl.

In the dog, however, the tail is more bushy than in the wolf, and is carried in a graceful curve over the back; while in the wolf it hangs down between the legs. It is further to be remarked, that the antipathy of the Esquimaux dog to the wolf is inveterate. He not only regards the wolf as an enemy, but fears it; and though he will attack the bear with undaunted energy, he never, unless impelled by necessity, ventures to assault the wolf. Often, indeed, he falls a sacrifice to this beast of prey, and is carried off even in sight of his owners.

To the Esquimaux their dogs are of the greatest importance. It is to them that they look for assistance in the chase of the seal, the bear, and the reindeer; for carrying burdens, and for drawing them on sledges over the trackless snow of their dreary plains. In summer, a single dog carries a weight of thirty pounds in attending his master in the pursuit of game; and in winter, six or seven dogs, yoked to a heavy sledge, with five or six persons, or a load of eight or ten hundredweight, will perform a journey of forty or fifty miles a day. On good roads they will travel this distance at the rate of eight miles an hour for several hours together; but on untrodden snow, twenty-five or thirty miles would be a fair day's journey. The same number of dogs, well fed, with a weight of only five or six hundred pounds, that of the sledge included, are almost unmanagable, and, on a smooth road, will go at the rate of ten miles an hour. While thus travelling, should they scent a reindeer, even a quarter of a mile distant, they gallop off furiously in the direction of the scent, and soon bring the game within reach of the arrow of the hunter. So acute, indeed, is their sense of smell, that they will discover a seal-hole by it entirely, at a very great distance.

The average height of the Esquimaux dog is one foot ten inches; generally the colour is

white, with something of a yellow tinge; but some are brindled, some black and white, and some black.

THE MACKENZIE RIVER DOG.

If the Esquimaux dog resembles the grey wolf of North America, equally does the Hare Indian's or Mackenzie River dog resemble the fox. This dog (*Canis familiaris, var. lagopus*) is characterised by a narrow, elongated, and pointed muzzle; by erect, sharp ears, and by a bushy tail, not carried erect, but only slightly curved upwards, and by the general slenderness of the form. The hair is fine and silky, thickening in winter, when it becomes white, or nearly so; but in summer it is marked by patches of greyish black or slate-grey, intermingled with shades of brown. So nearly does this dog resemble the arctic fox of the regions where it is found, that they have been considered merely as varieties of each other, one being of the wild, the other of the domesticated race. The Hare Indian's dog is never known to bark in its native country; and the beautiful pair brought to England by Sir John Franklin and Dr. Richardson, never acquired this canine language. One born in the Zoological Gardens, however (the pair in question having been presented to the Society), readily learned it, and made his voice sound as loudly as any European dog of his size and age.

This variety is of great value to the natives of the bleak and dreary realms where the moose and the reindeer are objects of the chase. Though it has not strength fitting it for pulling down such game, yet its broad feet and light make, enable it to run over the snow without sinking, if the slightest crust be formed on it, and thus easily to overtake the moose and the reindeer, and keep them at bay until the hunters come up. In the fox the pupil of the eye is oblong; in the dog, circular; but, independently of this, it is, to say the least, highly improbable that this intelligent dog is specifically identical with the arctic fox. If, for the sake of argument, however, we grant that it is, as some contend, and also that the Esquimaux dog is identical with the wolf, other dogs also being reclaimed wolves, we are involved in a dilemma; for we must then admit that the wolf and fox will breed together, and produce a fertile offspring, which those who contend for the wolfish origin of the dog by no means will allow to be possible.

THE POMERANIAN, OR WOLF-DOG.

The Pomeranian, or wolf-dog (*chien-loup*), and the Siberian dog, the Lapland dog, and the Iceland dog, of Buffon, appear to be closely related to the Esquimaux dog. Buffon regards them as varieties of the shepherd's dog, which he considers to be that which, of all, is nearest the primitive type, since, as he observes, in all inhabited countries, whether men be partially savage or civilised, dogs resembling this more than any other are spread; and he attributes its preservation to its utility, and its being abandoned to the peasantry charged with the care of flocks. If, however, great cerebral development and intelligence are to be received as tests of cultivation, we should be inclined to regard the shepherd's dog as one of the most remote from the original wild type, sharp and pointed as are its nose and ears. The forehead of the Pomeranian dog rises; the top of the head is arched and broad between the ears, and the hair is long, and sometimes matted. This dog is of middle size, but light, active, and strong.

Mr. Youatt, in his treatise on *The Dog*, says, the Pomeranian, or "wolf-dog, is no longer a native of Britain, because his services are not required there; but he is useful, in various parts of the continent, in the protection of the sheep from the attacks of the wolf. A pair of these dogs was brought to the Zoological Society of London, in 1833, and there long remained an ornament to the gardens. They appeared to possess a considerable degree of strength, but to be too gentle to contend with so powerful and ferocious an animal as the wolf. They were mostly covered with white or grey, or, occasionally, black hair, short on the head, ears, and feet, but long and silky on the body and tail. The forehead is elevated, and the muzzle lengthened, and clothed with short hair. The attachment of this dog to his master and the flock is very great; and he has not lost a particle of his sagacity; but, where wolves are common, is still used as a sheep-dog."

CHAPTER IV.

THE DOMESTIC DOG.—PASTORAL DOGS AND TERRIERS.

"DOMESTICATION," says Mr. Blaine, "proves a powerful agent in promoting various changes from the original form, characters, and habits of quadrupeds. By its agency they are enlarged to monstrosities, or diminished to pigmies; it even operates in the increase or decrease of the organs themselves. A breed of tailless cats and curtailed dogs has been perpetuated. The horns of cattle, essential as they are to the animals in their wild state, are dispensed with when the animals themselves are taken under the protection of man; and polled breeds of oxen and sheep are now common among us. We have an instance of the former in the Galloway bull. Neither need we wonder at these changes, great as they are, when we consider how numerous and how potent are the agents which the artifice and experience of man enable him to employ. Indeed, man himself, though apparently a free agent, is no longer the same being that he was when he lived in a pure state of nature. His external characters are much changed; while internally he is subjected to morbid alterations unknown to savages. Neither is it to be wondered at that the controlling power of man should be so influential, extending as it does over every important circumstance connected with the beasts around him. Man regulates at his pleasure the quantity and quality of their food; he also governs all their motions, and restrains their exercise to close confinement, or increases it to great and continued exertions. Even the temperature they reside in is raised or lowered at the will of the owner; and still further and more important restraint is put on them by regulating their sexual intercourse, which insures the perpetuation of almost any desired form, by allowing the propagation only between such individuals as approach the nearest thereto. In other instances, an accidental variation which may have occurred, or a singular deformity, has been seized on and propagated by future similar selections, until it became permanent, and then it constitutes a breed. To something of this kind we owe the wry-legged terriers; and it is probable, also, that a crooked mastiff offered the foundation for the bulldog."

THE SCOTCH COLLEY.

One of the theories to which we have alluded is that of ascribing the original dog to the pastoral or shepherd's breed, known in Scotland, and the north of England, as the Colley. However this may be, this species is certainly one of the most sagacious of all descriptions of dogs. Anecdotes, well authenticated, of his performances, would of themselves make a bulky volume. In the structure of the feet of this species of dog, there is a peculiarity which has attracted the observation of the naturalist. Mr. Richardson describes it as consisting of a greater or smaller number of supplemental toes or appendages, called "dew-claws," and situated at the hinder part of the foot. The pointer, the spaniel, and all dogs which prey upon ground game, without running it down in the chase, are possessed of these appendages, which evince, in a striking manner, the admirable care which Nature takes to adapt every animal to the duties which it has to perform. "They are soft and pendent," says Mr. Richardson, "but do not act by means of muscles, like the toes properly so called, but are a sort of fringe to the back part of the foot. In walking on hard surfaces they are of no use; and as they are liable to be torn and lacerated in beating among bushes, and thus to cripple the animals—for wounds in the feet of dogs are more injurious to them than in any other part of their bodies—they are cut off in sporting dogs when very young; but in shepherds' dogs, and in pastoral dogs generally, they are allowed to remain; and in the hill pastures especially, which are interspersed with bogs, and places between the hummocks of grass which consist of soft and sludgy peat, these dew-claws, by spreading out to their whole length by a little pressure, greatly extend the

surface of the foot, and thus enable it to bear up the animal in situations where it otherwise would sink, in the same manner as people furnished with snow shoes can walk over snowy surfaces, in which, if they had not these means of protection, they would sink knee-deep. This peculiarity is found wanting in all the coursing dogs, and in all those which, in a state of nature, find their prey upon the firm ground."

When we think of the sportsman walking over, and the dew-clawed dog running over, such bogs as are above alluded to, what reflections does the mind conjure up! Who can guess the secrets of the peat bog? Who can divine all that is buried beneath that sable and partially heath-covered surface? Far, far down in its depths, and even beneath the thin soil of the moor, lies hidden many a secret of bygone days. Below the grim, ghastly surface, the waters, and the black remnants of countless plants, lie the sad memorials of ages unknown to the history of man. Huge trees stand upright, and their gigantic roots rest upon the crowns of still older forest giants! In the inverted oaks of Murten Moor, in Switzerland, many see the famous oak woods that Charlemagne caused to be cut down, now more than a thousand years ago. For centuries the moors have concealed, in their silent bosoms, the gigantic works of ancient Rome. Far in the deep, lie buried in stone, hatchets and flint arrow-heads of Frisians and Cheruski, by the side of the copper kettle and the iron helmet of the Roman soldier. The skeletons of antediluvian animals rest there peaceably by the corpses of ancient races with sandals on their feet, and skins of animals around their naked bodies. Hundreds of brave English horsemen, who sought an honourable death in the battle of Solway, were swallowed up, horse and man, by the insatiable moor. In years bygone, a Danish King Harold, called the Blue Tooth, allured with foul treachery a fair princess of Norway, Gunhildo, to Jutland. She came, and she vanished from the memory of man. History had forgotten her, tradition had even began to fade; but the peat bog opened its long-closed lips, and accused, late, but loud, the bloody king, of this wicked deed. The poor princess was found far below the peat, strangled and tied to a post, where her merciless foe had buried her, as he thought, for ever, in the abyss.

THE COLLEY, OR SHEPHERD'S DOG.

Of the sagacity and faithfulness of the shepherd's dog many interesting narratives are current. It knows its master's flocks; it will single out a sheep under his direction, keep it separate, or disengage it again from the rest of the flock, should it regain or mingle with them; it will keep two flocks apart, and, should they become mixed, it will re-divide them. It will watch and defend them from strange dogs or foxes, and will drive them to any place required. It is, in fact, the shepherd's friend and assistant; it watches every look and every sign, is quick in apprehension, prompt in obedience, and pleased with its master's praise: and well does he who tends his flocks on the wide pasture-lands or mountain districts of our island, appreciate the services and fidelity of his attached ally.

Mr. Hogg, known by his poetical *soubriquet* of the "Ettrick Shepherd," has given us many anecdotes of the sagacity of this dog; and we ourselves, in the hill districts of Scotland, have seen many of them exhibit a degree of intelligence almost human.

He stands about twenty-one inches in height at the shoulder; is very gracefully shaped; ears half erect; muzzle pointed; coat long, but fine and silky; tail and hams fringed with hair; colour usually black and tan, or sandy yellow; but there are many black and white.

In England the species is larger, but, we think, scarcely so active, and certainly by no means so graceful, being destitute of tail. This apparent defect in the structure of the animal is not natural; but is the effect of what is termed "stringing," an operation performed when the animal is young, and which consists of pulling out the bone of the tail with the teeth. This causes the fleshy portion of the appendage to contract, until it becomes apparently nothing more than a mere tuft of hair. It is said that dogs thus denuded endure more fatigue than when in possession of their tails.

Both in Scotland and England the breed of the sheep-dogs is preserved with the greatest attention to purity. The Arab has scarcely greater affection for his horse than the Scottish shepherd has for his dog. As the one is the constant companion of the wanderer in the desert, so is the other the constant companion of the

flock-watcher of the mountains. In the points of size and strength, however, the Scotch and English breeds are much inferior to those of some other countries. In the Alps and the Pyrenees, for example, the breeds are much larger and stronger; whilst, in the neighbourhood of the Caucasian range, there is an equally large and powerful variety.

The "Colley" of France bears a strong resemblance to the English breed in form and size. His disposition is, also, similar; and he possesses all the attributes of the other. He likewise, in his puppyism, is denuded of that graceful appendage—the tail—a practice which we cannot help stigmatising as inhuman, and by no means counterbalanced by the additional benefits supposed to be derived from it by their masters.

Nearly allied to the "Colley" is the dog of the drover, somewhat larger, but equally sagacious. He would seem to be the produce of a cross with the lurcher. He has great courage and strength, and will attack the fiercest bullock, and hold him, if commanded so to do by his master.

The cur is a mongrel sprung from the Colley. He is a tantalising, barking, apparently spirited, but cowardly animal. He is the biter of the horses' heels, but the vigilant watch-dog of the humble dwelling of the cottager. His voice is always heard the moment an invader of the precincts of that tenement appears. The tail of the cur is mostly cut short; but Bewick says that many are whelped with short tails, which seem as if they had been cut, and these are called, in the North, "self-tailed dogs." Though this writer thinks the cur-dog to be a true or permanent breed, it seems to us that it is a cross between the shepherd's dog and some other race, perhaps the terrier.

TERRIERS.

Supposing the shepherd's dog to be the representative of a small section of the domestic canine race, the next to which we may turn is that of the terriers. These are a very hardy race, full of courage and spirit, and will face anything, without the slightest indication of fear. They are a small breed of dogs, but have an amazing degree of strength, a sharp bite, and have, to a great extent, the power of "holding on" to whatever they get within the grasp of their teeth. The property for which they are most distinguished is for hunting up such animals as burrow under ground, pressing them from their earths, and then attacking them with the utmost fierceness and determination. We have seen some Scotch terriers fight until they were lacerated in the most dreadful manner; and even then they would not give up the contest, however unequal, and had to be lifted and taken away. They will even face a badger with the most resolute spirit. All wild animals they will attack indiscriminately, although, properly speaking, they are what are called *vermin* dogs. Rats, mice, weasels, polecats, and badgers, they will fall upon on the instant; hence their value in the country, where the stock of the farmer is so frequently a prey to some of these marauding animals. To the rat they are a most determined foe; and well that it is so, for the great fecundity of these noxious animals is one of the circumstances which renders them so formidable in their destructive propensities. "Go," says a writer, "into a barn or granary, where hundreds are living, and you shall not see one; go to a rick that may be one living mass within, and there shall not be one visible; or dive into a cellar that may be perfectly infested with them, rats you shall not see; no, not so much as a tip of a tail, unless it be that of a stray one 'popping across for a more safe retreat.' As men seldom see them, they seldom think of them. But this I say," continues the writer, "that if rats could, by any means, be made to live on the surface of the earth, instead of in holes and corners, and feed and run about the streets and fields in open day, like dogs and sheep, the whole nation would be horror-stricken; and ultimately there would not be a man, woman, or child able to brandish a stick, but would have a dog, stick, or gun for their destruction, wherever they met with them. These midnight marauders and common enemies of mankind, devour the food, to the starvation of our fellow-creatures." The writer does not altogether ignore the argument of the friends of the rat—that these vermin destroy in the sewers much matter that would otherwise give out poisonous gases. Sewer rats, he admits, are not the very worst of the race; but even they should be slain wherever they may be caught. But the rats of the cellar, the

warehouse, the barn, the rick-yard, the granary, and the corn-field, are the grand destroyers against which war by the terrier, the trap, and the ferret should be proclaimed.

Whilst the terrier is one of the best of rat-killers, he is also a good house-dog, sufficiently vigilant, and at all times ready to attack any one who, at an improper season, dares to disturb the quiet of the household. Mr. Richardson tells us that he knows a gentleman who had a very fine Scotch terrier, which not only cleared a large farm, and also the farm-yard, of all vermin, but acted as cattle-dog or sheep-dog, as occasion required. He used successfully to repel the inroads of a very powerful and fierce boar, which was wont to come in a furious and formidable manner; so much so, indeed, that he often threw the labourers in the field into the greatest alarm; but if Trap happened to get notice of the invasion, the boar, though very large (much in the shape of a wild boar, and of that brindled colour which indicates the nearest approach to that formidable animal), paid severely for his temerity. The dog, which had been trained to keep animals in their right places, but to kill nothing except game and vermin, made no direct attack on the life of the boar. He laid hold of him by the ear; and that hold he kept till the boar, though much stronger and far heavier than the dog, was so completely subdued, that Trap could lead him by the ear to his own place of abode. The dog had seldom occasion to take him half-way; but he used to watch his motions; and if the boar offered to return, the dog instantly went to meet him, and so punished his other ear, that there was no need for a second warning, at least during the next week.

One of the principal uses of the terrier, as a hunting dog, is to accompany the foxhounds; and, in cases where all the earths are not carefully stopped he is indispensable, because his assistance is necessary in unearthing Reynard.

THE SCOTCH TERRIER.

Of this breed there are three varieties; one of a sandy-red colour, standing about eighteen inches high, very strong, with short stout legs; he has a large head in proportion to his body; a somewhat pointed muzzle, and an acute scent; his ears are small, and his bite very sharp. This variety is very common, and may frequently be seen quietly sitting at the door-steps of many of the houses in the more quiet and respectable localities of London. They abound in Scotland, and are generally known as the "Highland Terrier." The hair is hard and wiry, frequently closely or thickly matted; and when intermixed, or marked with white or any other colour, it is a certain sign of impurity. The best are such as are of a rufus, sandy, or black colour. They are extremely attached to their masters, and we think are very tenacious in memory. We, many years ago, possessed an impure specimen, which nevertheless was an excellent little dog; he either wandered or was stolen from us, in a place near Donne, in Stirlingshire; and several months afterwards we were told that such a dog was at a miller's, about twenty miles from where we were at that time. Neither the distance nor the uncertainty of its being our dog deterred us from setting out on foot (there were no conveyances in those days up to the hills) to ascertain the fact. Accordingly, we arrived at the miller's, and elevating our voice, heard "Pincher" reply from a small sort of granary, where he had been carefully detained. We soon had him at liberty; and we shall never forget the joy which he exhibited at our meeting. We walked immediately back; and, at the end of our journey, did not feel in the least tired, so happy were we at the recovery of our faithful and attached little dog.

The other two varieties are those of the Pepper and Mustard kind, celebrated by Sir Walter Scott in *Guy Mannering*, and the variety which prevails in the Western Islands of Scotland. The first is low, long-backed, and short-legged; with wiry and curly hair, and a pretty long muzzle. The second is about the same size as the sandy-red coloured one, but with the hair much longer, and having a more flowing appearance.

Besides these there is the

SKYE TERRIER.

This valuable little dog takes its name from one of the Hebrides, or western islands, where it is found in the greatest perfection. It is longer in the body and lower in the legs than the Highland dog; covered with long, silky, and silvery-looking hair, and has its breasts and

legs of a light or palish tan colour. It is considered the second variety of the Scotch terrier, and is famous for the destruction of vermin. In *Blackwood's Magazine*, a real Skye terrier is thus described:—"A mouth, the roof whereof is dark as midnight; his glittering eyes are black as jet; his ears short; his legs none of the longest; but his body is. His tail is a triumph, when fairly spread out; and as for the strength with which it is attached to his body, you may hold him up by the aforesaid tail as long as you can—with one hand. Then his hair is pepper-and-salt in hue, long and curly, and—if I may so speak (though no one but myself and the family will know exactly what I mean by it)—with a kind of silken wiriness."

THE ENGLISH TERRIER.

This dog is commonly of a black and tan colour; and those of this tint are the best; but they are sometimes white. If black and tan, they should not present a speck of white; and if white, they should be entirely of that colour.

In conflict, the English terrier is as resolute as the Scotch; but he is less capable of supporting cold, and is not so fond of the water. What was the primitive stock of this breed we cannot say; but we should be inclined to concur in the opinion of Mr. Richardson, that his original is to be found in the rough, or Scotch breed. We are the more inclined to this opinion, as we have seen a pair of beautiful Skye terriers, with careful feeding and nursing, gradually become smoother and shorter in the hair, until they seemed likely to lose their original character altogether. Mr. Richardson says, that a small, well-marked English terrier, under seven pounds' weight, will, if as *good* as he looks, fetch from five to ten guineas. The celebrated dog "Billy," who killed the hundred rats in less than five minutes, was a white English terrier, with a dark patch on the side of his head.

We have already alluded to the wonderful fecundity of rats, of which, according to the writer already quoted, Mr. Shaw's little dog, "Tiny," under six pounds' weight, destroyed *two thousand five hundred and twenty-five* pairs; which, had they been permitted to live, would, he says, within a given time, have produced *one thousand six hundred and thirty-three millions, one hundred and ninety thousand two hundred* living rats! Rats destroyed by Messrs. Shaw and Sabin in two years, amounting to *seventeen thousand* pairs, would, had they been permitted to live, have produced, at the calculation of this writer, and in the same time, no less than *ten thousand nine hundred and ninety-five millions, seven hundred and thirty-six thousand!* "Now," continues the writer, "let us calculate the amount of human food that they would destroy. In the first place, my informants tell me that six rats will consume, day by day, as much food as a man; secondly, that the thing has been tested, and that the estimate given was, that eight rats would consume more than an ordinary man. Now I—to place the thing beyond the smallest shadow of a doubt—will set down ten rats to eat as much as a man, not a child; nor will I say anything about what rats waste. And what shall we find to be the alarming result? Why, that the first pair of rats, with their three years' progeny, would consume, in the night, more food than *sixty-four thousand six hundred and eighty* men the year round, leaving eight rats to spare! And the rats destroyed by the little wonder, 'Tiny,' had they been permitted to live, would, at the same calculation, with their three years' progeny, have consumed as much food as *one hundred and sixty-three millions, three hundred and nineteen thousand and twenty men:* above two-thirds of the population of Europe!"

Verily, if this be the case, it is a happy arrangement in the great scheme of Providence, that some animals that have a more than usual fecundity, have been created to destroy each other when they become too numerous, and that terriers have been so constituted to assist in the destruction of rats!

THE TURNSPIT TERRIER.

This dog is a small, long-backed, cross-made thing, with the fore legs bent, first inwards and then outwards, presenting several windings, but rather of the crooked than the flowing kind, which Hogarth characterised as the line of beauty. He is a mongrel, and his name sufficiently denotes the meanness of the occupation in which he was formerly engaged. This was to turn a wheel, on which depended the spit which roasted the meat in the kitchen.

In this occupation, however servile, he had certainly a chance of coming in for a share of the "good things" of this world; and if his master were not of the barbarous school, the turnspit of old may have passed his time tolerably comfortable. The appliances of modern art have long ago abolished his employment. His occupation, like that of Othello's, has vanished, and he himself is fast passing from the face of the earth, and will, no doubt, ere long become extinct.

THE HARLEQUIN TERRIER.

This beautiful little *article* is, in form, the perfect model of the English terrier. He is of a slate colour, like the Skye, with a little tan about the legs and muzzle. This, though not always, is frequently the case, and he possesses all the higher attributes of his species in the most marked degree. Why he has been called after that extremely active gentleman, who, in a parti-coloured dress of very tight fit and variety of hue, figures on the stage in a Christmas pantomime, we are not quite certain. Perhaps it has arisen from the various patches with which he himself is sometimes marked, and which, in the opinion of many, greatly add to his beauty. The origin of this little dog has not been satisfactorily traced, but he is now a recognised variety.

"In former times," says Mr. Richardson, to whom we have already been so much indebted, "a brace of terriers used to accompany every pack of foxhounds, for the sake of unkennelling reynard, in the event of his taking to earth. This attendance has long been discontinued, as being no longer necessary, the fox being now run into too rapidly to admit of his giving the gallant terriers this trouble. Some recent writers do not appear aware of this circumstance, but gravely furnish us with long extracts from Daniel, &c., relative to this now obsolete practice."

THE RUSSIAN TERRIER.

This is a fine large specimen of his kind, and is in great demand in Scotland, on account of the valuable qualities of which he is found to be possessed. He will take the water like a spaniel, will tackle a wolf, and has all the vigilance of the most active and most keen of the Scotch breed. He stands high, being upwards of two feet at the shoulder; and, although he might, by some, be supposed to be a mastiff from his form, he does not belong to that breed, although he bears, in some points, a striking resemblance to it. He stands straight and well up; looks formidable, and presents a front of great courage.

The colour is usually black and tan; but many are of a sort of rufus, or reddish-brown. About twenty years ago two of these dogs were to be seen in the Scottish metropolis, equal in size to many a mastiff. In Germany they are known by the name of "bear-searchers."

THE SOUTH AMERICAN TERRIER

Bears a strong resemblance to the Russian, and is remarkable for its power of destroying reptiles—escaping the bite of the serpent with a certainty which surprises, when we consider the power of that reptile to twist, turn, or coil itself in almost every direction, and round anything of ordinary dimensions. Its spring is so rapid and sure, that it will seize the serpent by the back in an instant, and immediately crush its vertebræ to fragments. It is rarely to be seen in this country; but we have noticed it as belonging to the terrier species.

THE MEXICAN PRAIRIE DOG

Is amongst the most diminutive of the canine family. It is said to burrow in its native prairies in the manner that rabbits do in this country. Of this, however, we are not aware of any well-authenticated fact, although we remember having read, in the book of some obscure Mexican traveller, that such was the case. As he is not likely ever to become acclimatised in this, or be of much use in his own country, it is of little consequence to the general world what may be the nature of his habits; although, to the professed naturalist, as well as to those who are curious in matters of natural history, no doubt, a complete knowledge of these would be highly interesting.

THE MALTESE TERRIER.

The Maltese islands lie about forty-five miles from the southern shore of Sicily, and 150 to the east of the African coast, in the neighbourhood of Cape Bonn. They are nearly due north from Tripoli, on the coast of Africa, and are

composed of a group of three—Malta, Gozo, and Comino—of which the first is by far the largest. From the first of these islands the Maltese terrier takes its name; and although it has, by some naturalists, been classed with the spaniels, its habit of vermin-killing has induced others to class it with the terriers. It is very diminutive, and is usually black, though sometimes white; but, in whatever colour he appears, he should be of but one "all over."

This little animal was well known to the ancients, as he figures upon many Roman remains. He is now, however, nearly extinct; and the celebrated animal-painter, Landseer, has immortalised him in one of his paintings, as "The Last of his Race."

THE BULL-TERRIER

Is a cross between terrier and bulldog, varying in aspect according to the sort of terrier to which he owes descent. As his name implies, he is a mongrel, but is, nevertheless, a lively courageous dog, well adapted for all kinds of mischievous sport, and affording fewer unpleasant associations than the bulldog, while he is hardier than the terrier.

THE LURCHER.

The lurcher appears to be a mixed breed between the rough terrier or shepherd's dog and the greyhound, and is therefore a mongrel dog. Bewick informs us that it is shorter than the latter, with stronger limbs, and is covered with a rough coat of hair, commonly of a pale yellow colour. The scent of this dog being remarkably fine, he is often employed in killing hares and rabbits in the night. He steals silently and cautiously upon them while they are feeding, and then suddenly darts forward and seizes them.

CHAPTER V.

HOUNDS.

To introduce to and acclimatise various birds, animals, and fishes in Australia and New Zealand from this country, has, for some years, been the object of several colonists, ambitious of having the forests, fields, and rivers of their adopted homes, stored with such living remembrancers of the land they have left, as may preserve it for ever in their recollections. To a large extent, we believe, success has attended their efforts; and, we think, that something in the same way might be attempted for this country, seeing that there is much living beauty scattered over the globe that might, with little expense and trouble, be here naturalised. Certainly nature has distributed over the surface of the earth the races best fitted for each climate. And nowhere can a race arrive at such perfection and beauty as in its first home. Nevertheless, there are numerous races for which other climates besides their own are adapted. And in nothing have the ingenuity and energy of man been so magnificently displayed as in the introduction of new races. The art of acclimatisation is unquestionably capable of immense development. An association has been instituted in London, expressly for the purpose of improving the art to its utmost possibilities. In reference to man, the most extraordinary example of acclimatisation which modern times has produced, is the growth, by millions, of negroes in America and the West Indies. America and the West Indies are not well adapted to the European constitution; but the large, and always enlarging infusion of the negro blood will, doubtless, ultimately (if it has not already) produce the exact race the best suited for the climate. In America the results would be helped by saving from extinction the native American race. So far, however, as America is concerned, a new element is destined to come into play. The intercourse between

America and the eastern coast of Asia is rapidly extending. Already an emigration from China to America has begun. Through Russian and English influences the centre of Asia is moved, and the current will flow to the very heart of America. The central and Eastern Asiatic races are by no means comely; but they are strong—as strong in their way as the English race. In Australia, however, there is likely to be a still greater mingling of races than in America. Australia will receive hosts from Europe, hosts from Eastern and Central Asia, and hosts also from Southern Asia and Southern Africa.

Wherever the English race has penetrated, it has not failed to be the prevailing one; but it ought not anywhere to be the exclusive race. In India a large leaven of English blood is demanded. On the southern slopes of the Himalayas, and in other mountain ranges of India, colonies of Scottish Highlanders might be planted with immense advantage. But, besides, all English soldiers going to India should, when their term of service expires, settle there. This would have a manifold benefit. It would lessen the military expenditure; it would strengthen the English empire in India; and it would rapidly propagate the English language, and diffuse English civilisation. There is already no race equal to the English; but might it not at home be nobly transfigured, and thus be further moulded for its mighty achievements abroad? The English, properly so called, have sinew, solidity, indomitable endurance; but they are deficient in rapidity of movement, and in imagination. Blend with them the finest Asiatic races, and the defect is overcome. This we have already physically shown in our treatment of the English race-horse.

A beautiful experiment in acclimatisation would be to send to New Zealand the Circassians, who, by successive defeats, have been driven from their homes. The Circassians are universally admitted to be a singularly gifted, comely, and heroic race. In New Zealand they would find mountains as grand as those of the Caucasus, and no ferocious Russians to hunt them down.

But, whilst men can, almost anywhere be acclimatised, we are not so certain that this could be the case with such birds or beasts as must always be more or less under the power of climatic influence. It is not our purpose here to consider this question at large; but, in reference to the dog, we believe that even he, universal as is his distribution over the face of the earth, and hardy as is his nature, could not have his race perpetuated, if shifted from one climate to another. The dog of the tropics would not continue his race long in the higher latitudes of the temperate zone; nor would even the English dog long survive the rigours of an arctic region. Of this we have an example:—Mr. Lloyd, in his Swedish travels, was going to hunt the boar on the 16th of January, when the quicksilver was twenty-five degrees below zero; and though he was habited in his usual clothes, with the exception of an additional waistcoat, he experienced little inconvenience, as he kept himself warm with walking. From not sufficiently covering his ears, however, he got them slightly frost-bitten. What, however, was the case with Paijas, his only dog? He was an extreme sufferer. "This," he says, "was partly owing to his hair having become thin and ragged, in consequence of his advanced age. None of the native dogs, indeed, even in their full vigour, are altogether proof against the weather, if it be unusually severe. Their feet seem to be the most affected; for I have many a time seen them hold up their legs from the snow, and cry out most piteously. This being the case with animals whom Nature has provided with extremely warm jackets, it may be imagined how little able some of our thin-coated English dogs would be to face the rigours of a Northern winter.

"I saw this exemplified in two instances:—One was an English bloodhound, which Mr. Otway Cave, then member for Leicester, was so kind as to present to me; the other was a bulldog that I procured from home. Both of these dogs would, doubtless, have answered my purpose exceedingly well; but they could not exist in the forest, if the quicksilver happened to be a few degrees below zero. On one occasion, indeed, the bulldog became so benumbed with the cold, that his limbs absolutely stiffened; when, to save his life, I was obliged to cause one of my people, after putting him into a bag, to carry him a distance of some ten miles, to a habitable part of the country.

"As it was not full daylight when we reached the vicinity of the ring, we halted, and got up a good fire. This the poor dog seemed most thoroughly to enjoy; to ourselves, likewise, it was far from uncomfortable. Here we took some refreshment, which we needed, as we had breakfasted very slenderly prior to leaving Nas."

Other instances of the impossibility of acclimatising animals in such temperatures as are widely different from those to which their nature is congenial, might be adduced; but it is unnecessary here.

THE IRISH WOLF-DOG.

As in several other sciences, those who pursue the study of natural history, do not, in all points, agree in their opinions. Whilst the classification of the different varieties of species was founded by the great Cuvier upon their osteological structure, and craneological development; other naturalists, either from a natural desire of novelty, or from the equally natural wish to be original, and to show to the world that they have opinions of their own, have adopted other indications to decide what ought to be the standard of, or guide to canine classification. Colonel Smith seems to think that colour is the most proper guide to be adopted; whilst Mr. Martin thinks the ear, considered in relation to its size and form, is the best mark by which the variety may be determined. For us to enter upon the consideration of a subject of this kind, would only be to perplex what has already been said upon it, with, perhaps, novel ideas; but with such an amount of success as would give to ourselves little satisfaction, and, perhaps, less to our readers. All that we will say is, that we think Colonel Smith's theory is not likely to be adopted by the scientific naturalist; and that Mr. Martin's is something like judging of the character of a man's mind by the form and dimensions of his auricular organ. Cuvier's system is the least likely to lead to error, and, therefore, the more likely to be the most universally adopted. In reference to this system, in so far as the dog is concerned—and it is to no further extent that we refer—Mr. Richardson has given his assent, considering that the arrangement of the Frenchman has made all the varieties of the domestic dog easily to be divided into three classes.

In treating of the Irish wolf-dog, Mr. Richardson has separated it from both the Highland deer-hound and the Scottish greyhound; but this he has done from no conviction of its being right, but simply in deference to general opinion, which, he considers, incorrect, as "these three dogs, though originally identical, are now, unquestionably, distinct in many particulars." We shall treat them indiscriminately, as the distinctions between them, originally, would seem to have been very little.

"Silius describes a large and powerful greyhound as having been imported into Ireland by the Belgæ; thus identifying the Irish wolf-dog with the celebrated Belgic dog of antiquity, which we read of in so many places, as having been brought to Rome for the combats of the amphitheatre."

Hollinshed says of the Irish—"They are not without wolves, and greyhounds to hunt them, bigger of bone and limb than a colt." Campion also speaks of him as a "greyhound of great bone and limb." Evelyn, describing the savage sports of the bear-garden, says—"The bulldogs did exceedingly well; but the *Irish wolf-dog* exceeded, which was a tall *greyhound*, a stately creature, and did beat a cruel mastiff." Here we have an actual comparison of powers, which marks the dog to have been a greyhound, and quite distinct from a mastiff.

In the second edition of Smith's *History of Waterford*, the Irish wolf-dog is described as much taller than a mastiff, and as being of the greyhound form, unequalled in size and strength. Mr. Smith writes—"Roderick, King of Connaught, was obliged to furnish hawks and greyhounds to Henry II."

In the *Antiquities of Ireland*, by Sir James Ware, the wolf-dog is prominently spoken of:—"I must here take notice," he says, "of those hounds, which, from their hunting of wolves, are commonly called wolf-dogs, being creatures of great strength and size, and of a fine shape. I cannot but think that these are the dogs which Symmachus mentions in an epistle to his brother Flavianus. 'I thank you,' says he, 'for the present you made me of some *Canes Scotici*, which were shown at the Circensian games, to the great astonishment of the people, who could not judge it possible to bring them to Rome otherwise than in iron cages.' I am sensible Mr. Burton (*Itinerary*

of Anton., 220), treading the footsteps of Justus Lipsius (*Epist. ad Belg. Cent.*, i., p. 44), makes no scruple to say, that the dogs intended by Symmachus were British mastiffs. But, with submission to great names, how could the British mastiff get the appellation of *Scoticus* in the time of Symmachus? For he was consul of Rome in the latter end of the 4th century; at which time, and for some time before, and for many centuries after, Ireland was well known by the name of *Scotia*, as I have shown before (Chap. I.) Besides, the English mastiff was no way comparable to the Irish wolf-dog in size or elegant shape; nor would it make an *astonishing* figure in the spectacles exhibited in the circus. On the other hand, the Irish wolf-dog has been thought a valuable present to the greatest monarch, and is sought after, and is sent abroad to all quarters of the world; and this has been one cause why that noble creature has grown so scarce among us, as another is the neglect of the species since the extinction of wolves in Ireland; and even of what remain, the size seems to have dwindled from its ancient stateliness.

"When Sir Thomas Rowe was ambassador at the court of the Great Mogul, in the year 1615, that emperor desired him to send for some *Irish greyhounds*, as the most welcome present he could make him; which being done, the Mogul showed the greatest respect to Sir Thomas, and presented him with his picture, and several things of value.

"We see, in the public records, an earlier instance of the desire foreigners have had for hawks and wolf-dogs of Irish growth. In a privy seal from King Henry VIII. to the lord deputy and council of Ireland, wherein his majesty takes notice, 'that at the instant suit of the Duke of Alberkyrke of Spain (of the privy council to Henry VIII.), on the behalf of the Marquis of Desarrya and his son, that it might please his majesty to grant to the said marquis and his son, and the longer liver of them, yearly out of Ireland, two goshawks and four greyhounds; and forasmuch as the said duke hath done the king acceptable service in his wars, and that the king is informed that the said marquis beareth to him especial good-will, he therefore grants the said suit, and commands that the deputy for the time being shall take order for the delivery of the said hawks and greyhounds, unto the order of the said marquis and his son, and the longer liver of them yearly; and that the treasurer shall take the charges of buying the said hawks and hounds.'

"It is true that *British hounds* and *beagles* were in reputation among the Romans, for their speed and quick scent. Thus Nemesian, in his *Cunegetics*:—

> "'——Divisa Britannia mittit
> Veloces, nostrique orbis venatibus aptos.'
> "'Great Britain sends swift hounds,
> Fittest to hunt upon our grounds.'

And Appian calls the *British hound* σκυλαξ ἰχνευτηδος, a dog that *scents* the track of the game. But this character does not hit the Irish wolf-dog, which is not remarkable for any great sagacity in hunting by the nose.

"Ulysses Aldrovandus, and Gesner, have given descriptions of the *Canis Scoticus*, and two prints of them very little different from the common hunting-hound. 'They are,' says Gesner, 'something larger than the common hunting-hound, of a brown or sandy spotted colour, quick of smelling, and are employed on the borders between England and Scotland to follow thieves. They are called sleut-hounds.' In the *Regiam Majestatem* of Scotland, is this passage:—'Nullus perturbet aut impediat *Canem trassantem* aut, homines trassantes cum ipso ad sequendum latrones, aut ad capiendum latrones:'—(Nobody shall give any disturbance or hindrance to *tracing-dogs*, or men employed with them to trace or apprehend thieves or malefactors). This character no way agrees with the Irish wolf-dog; and the reader must observe, that when Gesner and Aldrovandus wrote, in the 16th century, *modern* Scotland was well known by the name of Scotia, which it was not in the 4th century, when Symmachus wrote the aforesaid epistle; and therefore the *Canis Scoticus*, described by Aldrovandus and Gesner, were dogs of different species."

Buffon regards the French Mâtin and the great Danish dog as the main stocks of the greyhound race; but this is not clear. In Scotland and Ireland, there existed, in very ancient times, a noble breed of greyhounds used for the chase of the wolf and the deer, and which appears to be the pure source of

our present breed. It is quite as probable that the mâtin is a modification of the ancient greyhound of Europe, represented by the Irish greyhound or wolf-dog, as that it is the source of that fine breed. Few, we believe, of the old Irish greyhound exist. In Scotland the old deer-hound may still be met with; and though it exceeds the common greyhound in size and strength, it is said to be below its ancient standard. With the extirpation of the wolf, the necessity of keeping up the race to the highest perfection ceased. The hair is wiry, the chest is remarkable for volume, and the limbs are long and muscular. A similar breed existed, and still continues to exist, in Albania, and was celebrated by the ancients for its prowess. In England, the greyhound was larger and stronger formerly than at present, and employed in chasing the stag. Queen Elizabeth was gratified one day, after dinner, by seeing from a turret, sixteen deer pulled down by greyhounds upon the lawn at Cowdrey Park, in Sussex.

In Arabia, Persia, and other parts of the East, a breed of greyhounds has existed from time immemorial. These dogs strongly resemble light coursing dogs, represented in Egyptian paintings, and are probably descended from them. Of the same type are the semi-wild, unowned street-dogs of Egypt, Syria, and South-western Asia. From the antiquity of the greyhound breed, we might be induced to suppose, that in it is to be seen the nearest approach to the primitive source, or one of the primitive sources of the reclaimed race; and, perhaps, the Arabian greyhound, or the lurcher-like street-dogs of Egypt, retain some characters in common with the primitive stock. Care and attention have elevated the British greyhound far above the ancient Egyptian coursing dog, or that of Arabia, of which the form of the head is wolfish, the tail fringed with long hair, and the ears, as seen in the paintings of the ancient Egyptians, erect and very acute. The Turkman watch-dog, for guarding sheep, is described as a large, rugged, fierce animal, equalling the wolf in stature, shaped like the Irish greyhound, and with equally powerful jaws. The ears are erect; the tail rather hairy; the general colour deep yellowish red. This race is of great antiquity, and doubtless still retains much of its pristine aspect, which is so wolf-like, that, according to Colonel Hamilton Smith, "a friend being present in Asia Minor at a wolf-hunt, allowed one (a wolf) to pass out of a brake, because he mistook him for one of the Turkman dogs."

In the Highland, or Celtic poems of Ossian, professedly translated by Macpherson, we find the ancient Irish wolf-dog, or the Scottish deer-hound, the subject of several traditions. "Bran" was the favourite dog of Fingal, the famous hero. In Mr. Scrope's volume on "Deer-stalking," we find the following:—

"Fingal agreed to hunt in the forest of Sledale, in company with the Sutherland chief, his contemporary, for the purpose of trying the comparative merits of their dogs. Fingal brought his celebrated dog Bran to Sutherland, in order to compete with an equally famous dog belonging to the Sutherland chief, and the only one in the country supposed to be any match for him. The approaching contest between these fine animals created great interest. White-breasted Bran was superior to the whole of Fingal's other dogs, even to the 'surly strength of Luath;' but the Sutherland dog, known by the full-sounding name of Phorp, was incomparably the best and most powerful dog that ever eyed a deer in his master's forests.

"When Fingal arrived in the forest with his retinue and dogs, he was saluted with a welcome that may be translated thus:—

> "'With your nine great dogs,
> With your nine smaller game-starting dogs,
> With your nine spears,
> Unwieldy weapons!
> And with your nine grey, sharp-edged swords,
> Famous were you in the foremost fight.'

"The Sutherland chief also made a conspicuous figure, with his followers, and his dogs, and weapons for the chase. Of the two rival dogs, Bran and Phorp, the following descriptions have still survived amongst some of the oldest people in Sutherland. Bran is thus represented:—

> "'The hind leg like a hook or bent bow;
> The breast like that of a garron;
> The ear like a leaf.'

"Such would Fingal, the chief of heroes, select from amongst the youth of his hunting-dogs. Phorp was black in colour, and his points are thus described:—

"'Two yellow feet, such as Bran had;
Two black eyes,
And a white breast;
A back narrow and fair,
As required for hunting;
And two erect ears of a dark-brown red.'

"Towards the close of the day, after some severe runs, which, however, still left the comparative merits of the two dogs a subject of hot dispute, Bran and Phorp were brought front to front, to prove their courage; and they were no sooner untied than they sprang at each other, and fought desperately. Phorp seemed about to overcome Bran, when his master, the Sutherland chief, unwilling that either of them should be killed, called out, 'Let each of us take away his dog.' Fingal objected to this; whereupon the Sutherland chief said, with a taunt, that 'it was now evident that the Fingalians did not possess a dog that could match with Phorp.'

"Angered and mortified, Fingal immediately extended his 'venomous paw,' as it is called (for the tradition represents him as possessing supernatural power), and with one hand he seized Phorp by the neck, and with the other, which was a charmed and destructive one, he tore out the brave animal's heart. This adventure occurred at a place near the March, between the parishes of Clyne and Kildonan, still called 'Leck na Con' (the Stone of the Dogs); there having been placed a large stone on the spot where they fought. The ground over which Fingal and the Sutherland chief hunted that day is called 'Dirrileck-Con.' Bran suffered so severely in the fight, that he died in Glen Loth before leaving the forest, and was buried there. A huge cairn was heaped over him, which still remains, and is known by the name of 'Cairn Bran.'"

Thus, whilst the ancient Highland chiefs piled a cairn, or heap of small stones, on the graves of their favourite dogs, modern admirers erect to them monuments, and engrave upon them epitaphs, which celebrate their virtues.

The original greyhound was a long-haired dog; and the modern smooth-coated and thin animal, now known by that name, is comparatively of recent date. Of this we have sufficient evidence in the ancient monuments of Egypt, where, as well as in Persia and India, rough greyhounds of great size and power still exist. A dog of the same kind has been described by H. Smith, as well known in Arabia; and a gigantic rough greyhound was found by Dr. Clarke, on the confines of Circassia, and by him described as identical with our old Irish greyhound.

THE NEWFOUNDLAND, LABRADOR, AND ST. BERNARD DOGS.

We are inclined to consider the Italian wolf-dog, used in the Abruzzi by the shepherds to defend their flocks, the Newfoundland and Labrador dog, and the Alpine dog, as the representatives of a distinct group; the latter dog, indeed, approximates to the mastiff. We have seen several noble specimens of the Alpine, or St. Bernard breed: their size is equal to that of the largest mastiff; the muzzle is deep; the ears are pendulous; the fur is rather long and wiry; the eye is full and very expressive; and the form of the body and limbs indicates great strength. Their sense of smell is very acute, and aids them in the work of mercy to which the worthy monks of the convent of the Great St. Bernard have applied them. To the honour of those excellent men be it spoken, that while others have trained the dog to the combat, to the chase of the runaway slave, and to the pursuit of game, they have availed themselves of the power, intelligence, and courage of the animal, to rescue the unhappy traveller from the horrors of death amidst the snows of the mountains.

One of these noble dogs was decorated with a medal, in commemoration of his having saved the lives of twenty-two persons, who, but for his sagacity, must have perished. He was lost in 1816, in an attempt to convey a poor traveller to his anxious family. The man was a Piedmontese courier, who arrived at St. Bernard in a very stormy season, labouring to make his way to the little village of St. Pierre, in the valley beneath the mountain, where his wife and children dwelt. It was in vain that the monks attempted to check his resolution to reach his family. They at last gave him two guides, each of whom was accompanied by a dog, of which one was the remarkable creature whose services had been so valuable to mankind. Descending from the convent, they were in an instant overwhelmed by two avalanches; and the same common destruction

awaited the family of the poor courier, who were toiling up the mountain to obtain some news of their expected friend: they all perished. A story is told of one of these dogs, who having found a child unhurt, whose mother had been destroyed by an avalanche, induced the boy to mount upon his back, and thus carried him to the gate of the convent. The incident forms the subject of a French print.

The wolf-dog of the Abruzzi is pure white, somewhat more lightly formed than the Newfoundland dog, but strong and muscular, and the hair is long and flowing.

What our ancestors suffered from the ravages of wolves, may readily be inferred from the various plans which are, at the present day, adopted in other countries infested by them for their rapid destruction.

Mr. Greiff, one of the oldest and best sportsmen in Sweden, dwelt in Stockholm, and took a very prominent part on the occasion of the political convulsions which agitated that country between 1820—'30. It was he who seized the person of the king Gustavus, in which act the monarch slightly wounded him with a sword which he then held in his hand. Mr. Greiff, however, being a man of herculean strength, wrested this weapon from the hand of his sovereign, and took him up in his arms, as he would have done a child, and conveyed him to a place of security. By thus periling his life, Mr. Greiff was, perhaps, a principal means of bringing about a bloodless revolution. This gentleman gives us a somewhat minute account of the plans adopted by his countrymen for the destruction of wolves in the neighbourhood of the Swedish capital. We take the account from Mr. Lloyd, whose bear and wolf-hunting exploits furnished him with the materials for a very interesting couple of volumes:—

A spot covered with a tolerably thick wood of large trees, especially spruce, where the ground is undulating, and which contains fens and mosses, and of such great extent, that the pathway does not pass over fields or plains which prevent the tracing of the animals, after a fall of snow or sleet, is the suitable place for entrapping wolves. The wood must be left quiet from passengers, or woodsmen, during the time of hunting—or, in other words, the winter season; and should be situated near the centre of the parish whose peasants are to form the skall, or trap. A cottage should be near the place, that the under huntsmen may find quarters, and have opportunity to call up in haste the men employed to fasten on the Jagttyg, or hunting-cloth, by which the daily watch of a whole division of the country, for this purpose, will be avoided.

The hewing down of trees, for the purpose of forming the skall-plat, or place of lure, should take place in the month of August or September, when the assistance of the authorities must be required. If the wood is not of the thickest and heaviest kind, the skall-plats should be ready in two to three days, with thirty to forty labourers per day.

When the skall-plat is ready, it must be kept undisturbed by the woodsmen, and from all noise.

In the month of October, when the peasants begin to kill their worn-out horses, the head-ranger gives them intimation that they shall, in conformity with orders from authority, transport them to the hunting or lure-place, and give the necessary commands for their skinning; and also that a huntsman is to be at hand to direct that the carrion should be laid in the proper place.

As soon as the ground is frozen, the hunting-cloth is brought out, which must be smoothed well down, and beaten with fir branches, so that all shall be prepared against the first falling snow; for the hunts which can be formed by the traces on the first snow, or before Christmas, are the surest.

Two huntsmen are then ordered to keep watch at the skall-plat, the day on which the snow has fallen; and they should go round it three times a day, morning and evening, and once during the night with a lantern of tin, so constructed, that it only throws light from the bottom; the marks of the animals going in and out are carefully noted each time, and written down in a journal, and whether they follow each other in numbers, or go singly.

An experienced huntsman will soon discover at what time the animals visit the carrion; the 8th, 11th, and 14th days are usually the periods, after they have once eaten of it. It happens that wolves, early in winter, get into the skall-plat, and lie there several days, without their traces being discovered; and, on such occasions,

it is necessary to drive them gently out again, in order to ascertain their number.

Each time of going round the area, every track is to be swept out with a long broom; and if the huntsman at any time have occasion to step out of the pathway, the marks should be immediately obliterated. Birds of prey, such as ravens and crows, must not be frightened away, because they entice the wild beasts by their cries, and give them confidence.

The huntsmen then examine each his side of the skall-plat: should it be found, when they meet, that traces of such animals as have entered are sufficiently numerous to fasten up the hunting-cloths, the men, for that purpose, are called out immediately; and the fastening should be executed with all possible expedition, and the whole finished within two hours.

The fastening ought to commence either at the top or at the bottom of the skall-plats, where two rolls of cloth should be lying ready. One man unloosens the roll—the other carries the pole on which it is wound. They advance along the line, unwinding as they go. The roll should be wound round the pole, so that it unwinds correctly and easily. A third man fastens the cloth round the end of each stake. When the hunting-cloth is fastened up, the men who have been so employed return each along his allotted distance, and rectifies what he finds amiss. The pieces of cloth ought to hang three feet from the ground. The huntsmen then reconnoitre the skall-plat, to ascertain whether the animals have escaped during the fastening. If that be the case, the hunting-cloths are immediately taken down, wound up, and laid in their places.

When it is found that the animals are enclosed, messengers are immediately dispatched, to apprise the people of the time of assembling for the hunt, and of the number required, according to the size of the skall-plat, reckoning eight, and, at the utmost, ten, hunting-paces between each person.

From the moment it is ascertained that the animals are enclosed, and until the hunt takes place, the utmost silence is to be observed at and about the skall-plat.

When the people are assembled, and the numbers communicated to the head-ranger, they advance silently to the skall-plat, and are formed in two divisions, either at the top or at the bottom. A huntsman goes before each division, and a huntsman after. They place each peasant in his proper situation, and inform him what he is to attend to; namely—to stand on the outside of the hunting-cloths; to remain silent, and not to go from his post; but, if the animals show themselves, he is to shake and strike against the cloths with his hunting-staff or spear.

The Skalfogdar, or subordinate officers of the hunt, are chosen from trusty people, who are acquainted with the locality; soldiers are preferable. These, together with the superfluous huntsmen, are distributed among the body which is to advance, and should, for the preservation of better order, be distinguished by some badge.

Should there be any of the royal family present, the head-ranger himself advances in the centre; otherwise, a trusty huntsman, who should preserve a steady pace in his advance.

The driving division ought to advance slowly, because too much haste brings the people sooner into disorder. The movement ought to be effected without shots or cries; only they are to strike the trees with their hunting-poles, and examine carefully if any animal has hidden himself, or lies dead.

When the people have advanced to the farthest point, the wild animals which have been shot are conveyed to the king's skreen.

No other than good marksmen are allowed to carry a gun.

Such is the importance of the arrangements made, even at this day, in Scandinavia, for the slaying of the wolf.

THE HIGHLAND DEER-HOUND.

The *Highland deer-hound* has the general appearance of a high-bred greyhound, especially in all the points on which speed and power depend; but he is built more coarsely, and altogether on a larger and grander scale. The shoulder is also more elevated; the neck thicker; the head and muzzle coarser; and the bone more massive. He stands from twenty-eight to thirty inches in height at the shoulder; his coat is rough, and the hair strong; colour usually sandy yellow, iron grey, or white. *All colours* should have the muzzle and tips of the

ears black. A tuft, or pencil of dark hair on the tip of the ear, is a proof of high blood.

This is a very powerful dog, equally staunch and faithful; and when the Scottish mountains swarmed with stags and roes, it was held in high estimation, as being capable of following the deer over surfaces too rough and fatiguing for the ordinary hounds of the low country. "The general aspect of the Highland hound," says Mr. Richardson, "is commanding and fierce. His head is long, and muzzle rather sharp; his ears pendulous, but not long; his eyes large, keen, and penetrating, half-concealed among the long, stiff, and bristly hair with which his face is covered; his body is very strong and muscular, deep-chested, tapering towards the loins; and his back slightly arched. His hind quarters are furnished with large prominent muscles; and his legs are long, strong-boned, and straight—a combination of qualities which gives him that speed and long duration in the chase for which he is so eminently distinguished. His hair is wiry and shaggy, of a reddish sand colour, mixed with white; his tail is rough, which he carries somewhat in the manner of a stag hound, but not quite so erect. This is the dog formerly used by the Highland chieftains of Scotland in their grand hunting parties; and is, in all probability, the same noble dog used in the time of Ossian. The Scottish Highland greyhound will either hunt in packs or singly."

The following description of deer-coursing, written by Mr. Scrope, presents us with a faithful picture of the mode of using the hounds adapted for that purpose in the Highlands:—

"No time was to be lost; the whole party immediately moved forward in silent and breathless expectation, with the dogs in front, straining in the slips; and on our reaching the top of the hillock, we got a full view of the noble stag, which, having heard our footsteps, had sprung to his legs, and was staring us full in the face, at the distance of about sixty yards.

"The dogs were slipped; a general halloo burst from the whole party, and the stag, wheeling round, set off at full speed, with 'Buskar' and 'Bran' straining after him.

"The brown figure of the deer, with his noble antlers laid back, contrasted with the light colour of the dogs, stretching along the dark heath, presented one of the most exciting scenes that it is possible to imagine.

"The deer's first attempt was to gain some rising ground to the left of the spot where we stood, and rather behind us; but, being closely pursued by the dogs, he soon found that his only safety was in speed; and as a deer does not run well up hill, nor like a roe, straight down hill, on the dogs approaching him, he turned, and almost retraced his steps, taking, however, a steeper line of descent than the one by which he ascended. Here the chase became more interesting; the dogs pressed him hard, and the deer, getting confused, found himself suddenly on the brink of a small precipice, of about fourteen feet in height, from the bottom of which there sloped a rugged mass of stones. He paused for a moment, as if afraid to take the leap; but the dogs were so close that he had no alternative.

"At this time the party were not above 150 yards distant, and most anxiously awaited the result, fearing, from the ruggedness of the ground below, that the deer would not survive the leap. They were, however, soon relieved from their anxiety; for though he took the leap, he did so more cunningly than gallantly, dropping himself in the most singular manner, so that his hind legs first reached the broken rocks below; nor were the dogs long in following him. 'Buskar' sprang first, and, extraordinary to relate, did not lose his legs; 'Bran' followed, and, on reaching the ground, performed a complete summersault; he soon, however, recovered his legs, and the chase was continued in an oblique direction down the side of a most rugged and rocky brae, the deer apparently more fresh and nimble than ever, jumping through the rocks like a goat, and the dogs well up, though occasionally receiving the most fearful falls.

"From the high position in which we were placed, the chase was visible for nearly half a mile; but some rising ground intercepting our view, we made with all speed for a higher point. On reaching it we could perceive that the dogs, having got upon smooth ground, had gained on the deer, which was still going at speed, and were now close up with him. 'Bran' was then leading, and in a few seconds

was at his heels, and immediately seized his hock with such violence of grasp, as seemed, in a great measure, to paralyse the limb, for the deer's speed was immediately checked.

"'Buskar' was not far behind; for soon afterwards passing 'Bran,' he seized the deer by the neck. Notwithstanding the weight of the two dogs, which were hanging to him, having the assistance of the slope of the ground, he continued dragging them along at a most extraordinary rate, in defiance of their utmost exertions to detain him, and succeeded more than once in kicking 'Bran' off. But he became at length exhausted; the dogs succeeded in pulling him down, and, though he made several attempts to rise, he never completely regained his legs. On coming up we found him perfectly dead."

The Highland chiefs of former days were wont to hunt the stag with all the pomp and magnificence of Eastern sovereigns. Under the plea of a deer-hunt, they would sometimes assemble four or five thousand of their clan, ostensibly for the purpose of driving the deer into their toils, but, in reality, for very different purposes. Walter Scott, if our memory serves us, alludes to this circumstance in his *Waverley*. When the government found out the secret of these "gatherings," they were suppressed by an act of parliament.

The elegant appearance of the stag has always procured for it great admiration; and although he is a native of many parts of Europe, he is supposed to have been originally introduced to this country from France.

By way of contrast to the animated prose description of Mr. Scrope, we present our readers with another, equally animated, although in the "poetical vein."

The stag, too, singled from the herd, where long
He rang'd, the branching monarch of the shades,
Before the tempest drives. At first, in speed
He, sprightly, puts his faith; and, rous'd by fear,
Gives all his swift aërial soul to flight.
Against the breeze he darts, that way the more
To leave the lessening murderous cry behind.
Deception short! though fleeter than the winds
Blown o'er the keen-air'd mountains by the north,
He bursts the thickets, glances through the glades,
And plunges deep into the wildest wood.
If slow, yet sure adhesive to the track,
Hot streaming, up behind him come again
Th' inhuman route, and from the shady depth
Expel him, circling through his ev'ry shift.
He sweeps the forest oft; and sobbing sees
The glades, mild opening to the golden day;
Where, in kind contest, with his butting friends
He wont to struggle, or his loves enjoy.
Oft in the full-descending flood he tries
To lose the scent, and lave his burning sides;
Oft seeks the herd: the watchful herd, alarm'd,
With selfish care avoid a brother's woe.
What shall he do? His once so vivid nerves,
So full of buoyant spirit, now no more
Inspire the course; but fainting, breathless toil,
Sick, seizes on his heart; he stands at bay;
And puts his last weak refuge in despair.
The big round tears run down his dappled face;
He groans in anguish; while the growling pack,
Blood-happy, hang at his fair-jutting chest,
And mark his beauteous chequer'd sides with gore

It must be acknowledged that there is something exceedingly exciting in the hunting of the larger kinds of animals, whether on horseback or foot, with dog or gun. Princes of every age and country have been remarkable for their love of the chase; and one who, within these few years, has obtained no little celebrity in the eyes of the political world of Europe, is a devoted lover of the chase. Victor Emmanuel, of Italy, is one of the most enthusiastic hunters of the day. He has hunting quarters in the vicinity of the Alps—those stupendous mountain ranges which realise to the imagination all that Byron has written of "mountain majesty." When he sets out for these quarters, as a body-guard round the royal cavalcade, there walk about forty or fifty of the hardiest mountaineers of these districts, armed with rusty fowling-pieces, and destined to beat the bush, and drive the game to the sportsmen. The king is habited in a broad-brimmed wideawake, and a grey hunting-suit of coarse woollen cloth, all of one colour, agreeably to fashion. He looks a kind of bluff Henry VIII. of England, equally stout, darkly sunburnt, with a deep, almost livid, red, round and behind the ears, bristling with moustaches, stretching from the lips all across the face—not a man to be loved or valued by those who do not look below the surface. The tents destined for himself and his party he has pitched about an hour's walk up a valley, deep in a glen shut in by bare rocks—a whole craggy wilderness, the refuge of *chamois* and *bouquetins*. With the exception of the character of the game, this is thoroughly Scotch.

For a long time this heroic sovereign seemed

to think that the only occupation fit for a king was war and the chase; though he never was unmindful of the noble saying of one of his ancestors, that "a sovereign's greatest prerogative was to give and to forgive." During his father's lifetime, in peaceful days, the then Duke of Savoy was only a forester. Men saw but little of him, unless they chose to meet him in the woods of Pollenzo or Racconigi, with a double-barrelled gun on his shoulders, and so plainly attired, that a good peasant of the neighbourhood once mistook him for a gamekeeper, and offered him a three-franc bribe to shoot him a fox which laid waste his poultry-yard; when the king humoured the good man, and, effecting the object, accepted and pocketed the money. After Charles Albert's death, when Victor had to play king in the camp, in the council-chamber, and parliament, his favourite field amusements were greatly curtailed. But the gun and the rifle were never set aside; and in the hot summer he had his holiday, when he would pitch his tent near "Our Lady of the Snow," on the top of Val d'Orco; or in some even more inaccessible savage spot in Val d'Aosta, and thence run and race, and climb and creep on all-fours, on the brink of precipices, staking his royal life against the carcass of a stambecco. Stambecco-stalking on the Alps lasts naturally but a short season; yet business shortened it more and more with the subsequent aggrandisement of the state, and the deepening of political complications. His hunting habits are very austere. He robs himself of sleep, rises regularly at midnight, calls up the whole household, visits the stables, sees to horses, hounds, and guns; and, after assuring himself that all is right, and all in readiness, he snatches a few hours more rest; then up he is again at earliest daybreak; the horn is wound, the hunt is up, and away he rides as fast as the nimblest mountain nag can carry him, and then takes to his legs, and the race is between him and the swiftest quadrupeds, over crags and along gullies common men shudder only to look at. Once upon a time, it is related that he came back to Turin in great glee, telling his friends he had given chase to a *bouquetin* for two whole days; had parted company with his aides-de-camp, his guides, his huntsmen, every man in his suite. He had followed the coy mountain goat; he had pressed closer and closer; he had driven higher and higher up; he had knocked it up, blown all the wind out of its panting body, and had, at last, brought it back triumphant, the prize of that untamed strength which has scarcely a match anywhere.

Feats like these we might expect to see in this island, performed by some daring Highland chief, in the days of George II.; but, alas! money-hunting and *mongrelism* have made us degenerate.

Turning from the hunting of the "buck and the roe," the *chamois* and the *bouquetins*, to that of the wild boar, a yet wilder enthusiasm is displayed.

Among the exercises that contribute most towards forming good military riders, are the hunts organised in Northern Africa, by the French Algerian authorities, for the destruction of dangerous animals. Wherever French troops are, they require to be actively employed. Accordingly, they are sent to Algeria, as to a school of adversity, to become inured to toil and hardships; and when not employed in suppressing any disturbances that may arise among the Arab tribes, or in opening up new routes, or in constructing forts and earthworks, the chase affords an opportunity for the exertion and excitement so necessary for the due maintenance of the soldier's health and vigour. During a spring excursion, made by the 1st regiment of the *Chasseurs d'Afrique*, a wild boar-hunt was got up at almost every halt. A scene from a hunt which took place at Bordj-Bouïra, exhibits, in a forcible manner, the excitement which animates all parties engaged in it.

On arriving at the bivouac of Bordj-Bouïra, the neighbouring ravines were pointed out to the colonel of the regiment, who commanded the column, as the resort of boars and other wild beasts. By his orders, a *grande chasse* was immediately organised, and promised more than the ordinary amount of excitement, as the natives had announced the news of a lion having been recently seen in the neighbourhood. The hunting-ground comprised a number of parallel ravines, somewhat deep, descending from the spur of the Jurjura, the ridges of the different passes inclining gradually towards the plain of the Hamza. All the country about here is either wooded or covered

with formidable thickets. There are but very few regular paths, and those only practicable for the surefooted Arab horses.

At the appointed hour, the native chiefs brought to the "meet" at least three hundred scouts, a certain number of whom were on horseback, and provided with firearms; the remainder on foot, and merely armed with *motrags*, or thick sticks. All these Arabs were placed upon the same line, in the plain opposite the mountain, the shooters being distribnted along the ridges, and wherever there was a chance of seeing a wild boar pass. This picturesque arrangement greatly assists the imagination in drawing for itself a beautiful scene. On a preconcerted signal being given, the scouts advanced, beating up the thickets of juniper and jujube trees, and uttering loud and almost deafening cries, so as to drive out the animals from their cover in the ravines. A troop of wild boars soon took flight in the direction of the mountain. Some of these were promptly killed by the armed scouts at their different posts—but immediately afterwards the scene changed. The Arab mounted scouts, as well as the French troopers, animated by the sight of the monstrous animals, and by the sounds of the firearms, hastened to the pursuit of the boars that had succeeded in forcing the lines of the *tireurs;* and then began one of those headlong races, of which it is difficult to say whether we most admire the skill and boldness of the riders, or the energy, grace, and suppleness of their Arab horses, which, going at the top of their speed, clear every obstacle with a surety of foot that is never deceived, even on the steepest and most rugged paths.

The remainder of the fugitive herd was speedily encompassed by all the huntsmen, both French and Arab being carried away and electrified, as it were, by mutual excitement. Gun-shots and pistol-shots were fired off on every side, so that there was a certain amount of danger in being present at such a *mêlée;* for whenever an Arab smells powder he becomes intoxicated, and fires away indiscriminately, to the right or to the left, not at all heeding who may be near—a characteristic, we may observe, that gives us no very high idea of their sporting qualifications.

The band having been thus destroyed without accident to the "assistants," the trumpets sounded the recall. The number of victims was fourteen full-grown boars, and six young ones. They were all brought to the place of rendezvous, and put upon mules, to be taken in triumph into the camp. The *chasseurs*, with their colonel at the head of the column, formed the escort; the march was enlivened by repeated flourishes of trumpets; and, at the entrance of the bivouacking-ground, a *feu-de-joie* was discharged in the air in front ot those who had remained behind, but who had come out to meet "the return from the hunt." Not the least brilliant part of the scenes composing the general action here, must have been the great variety of the costumes, and the gaiety of the Arabian horsemen, wheeling about on their splendid steeds, under the rays of an African sun. The wild boars were afterwards arranged in order on the ground, and each sportsman sought to recognise the animal which he supposed had fallen from the effect of his weapon.

In the evening, the bivouac of the 1st regiment of *chasseurs* was particularly gay. The men, arranged as in small tribes, took their seats around the large kettles that gave forth an appetite-creating odour; and, as they partook of the savoury slices of boar-flesh, they related to each other the "moving events" of the day. Some openly expressed regret at not having encountered the lion; but it may readily be supposed that the majority inwardly rejoiced at having avoided him.

Changing the scene, and returning to our own island, we pause for a moment to dwell upon the principal hunting national sport of England—fox-hunting. This sport presents us with very different features from such as we have just related; but it is, nevertheless, equally exciting. There are, perhaps, now more hunting, more "meets," and more numerous fields here than there were at any former period. Ladies, too, enliven the sport by their presence; and here we may observe, that the riding-habit of these "fair creatures" was first introduced in the reign of Charles II.; but, even in the days of Queen Anne, was viewed with some degree of animadversion. This is proved by the following satirical remarks of Addison:—"Among the several female extravagancies I have already taken notice of, there is one which still keeps its

Painted by A Cooper R.A

Engraved by W.R. Smith

FOX BREAKING COVER

ground—I mean that of ladies who dress themselves in a hat and feather, a riding-coat, and a periwig, or at least tie up their hair in a bag or ribbon, in imitation of the smart part of the opposite sex." And he thus more particularly favours us with a description of one of these anomalous personages:—"*His* hair, well curled and powdered, hung to a considerable length on his shoulders, and was tied, as if by the hand of his mistress, with a scarlet ribbon, which played like a streamer behind him; he had a coat and waistcoat of blue camlet, trimmed and embroidered with silver; a cravat of the finest lace; and wore, in a smart cock, a little beaver hat, edged with silver, and made more sprightly by a feather. * * * As I was pitying the luxury of this young person, who appeared to me to have been only educated as an object of sight, I perceived, on my nearer approach, and as I turned my eye downward, a part of the equipage I had not observed before, which was a petticoat of the same as the coat and waistcoat."

The modern huntswoman is not quite so gaily attired; but if she were, she, no doubt, would be in the fashion. Be this as it may, however, the sport of fox-hunting is not now, as it was in former times, restricted to any particular class of men. Although the old Epping Hunt, of venerable antiquity, in virtue of the right of *free warren*, confirmed to the citizens of London by Henry III., in 1226, has lost its former *prestige*, the lord mayor, aldermen, and corporation no longer proceeding to the hunt in "solemn guise," many wealthy citizens, by the aid of the railways, take their turn with the hounds at the various "meets," within a few hours' distance from town, perhaps once or twice a week, and return to look in at their offices and counting-houses just before the close of business.

Of course there is now, as, indeed, there always was, a great disparity in the character of the fields, and the ceremonial observed in them. At "provincial" meets the costume is very *ad libitum*—the farmer, the horsedealer, the barrister, the little country attorney, often turning out in *mufti;* whilst the M.P., the city merchant, and the leading men of the county, appear in the legitimate scarlet. Leicestershire is the hunting county *par excellence;* and Melton Mowbray, the head-quarters. This was, till lately, a prettily situated, insignificant town; but it is now quickly becoming a sort of metropolis for our fox-hunting aristocracy. "The uninitiated reader," says Nimrod, "would, perhaps, be surprised by an enumeration of the persons of rank, wealth, and fashion, who, during several months of every year, resign the comforts and elegancies of their family mansion, for a small house in some town or village of Leicestershire—to any, but the eye of a sportsman, nearly the ugliest county in England." The same authority gives us the following *coup-d'œil* of the legitimate Meltonian, which contrasts widely with the miscellaneous lot in a "provincial" hunt; and as strangely with the hunting gentry of the time of George II., as we have seen represented in a picture of Mr. Taylor, the artist. "The style of your Meltonian fox-hunter has long distinguished him above his brethren of what he calls the *provincial* chase. When turned out of the hands of his valet, he presents the very *beau-ideal* of his *caste*. The exact fit of his coat, the superlatively well-cleaned leather breeches, and the generally apparent high breeding of the man, can seldom be matched elsewhere; and the most cautious sceptic would generally satisfy himself on this fact at a single inspection."

One more passage from this entertaining writer and thoroughgoing sportsman, drawing the line between the fox-hunter of the eighteenth and the nineteenth centuries respectively:—"Compared with the luxurious ease with which the modern sportsman is conveyed to the field—either lolling in his chaise and four, or galloping along at the rate of twenty miles an hour on a hundred-guinea hack—the situation of his predecessor was all but distressing. In proportion to the distance he had to ride by starlight, were his hours of rest broken in upon; and, exclusive of the time which that operation might consume, another serious matter was to be provided for. This was the filling his hair with powder and pomatum until it could hold no more, and forming it into a well-turned knot, or club, as it was called by his valet, which was commonly a good hour's work. The protecting mud-boot, the cantering hack, the second horn in the field, were luxuries unknown to him; and his well-soiled buskins and brown-topped

boots would have cut an indifferent figure in the presence of a modern connoisseur by a Leicestershire cover-side. Notwithstanding all this, however, we are inclined strongly to suspect, that out of a given number of gentlemen taking the field with hounds, the proportion of really scientific sportsmen may have been in favour of the olden times."

Another still more important change effected in modern hunting, however, is in the character of the horses. They are now higher bred than before, and much faster; but on this subject we have sufficiently spoken in the first division of this work.

Regarding the costume of the sportsmen in the days of George II., it may be observed that the gentlemen wore the heavy, square-cut, buckram-supported coat, which was generally common in society; the triangular hat; the powdered and pomatumed head, and the pig-tail appendage. The large three-cornered cocked hat, called a kevenhuller, was imported from Germany, and is a speciality of the times of the first two Georges. It is thus described by a writer of the time:—"It is shaped like an equilateral triangle, placed with the most mathematical precision on the head, somewhat elevated behind, and sloping in an unvarying angle downwards to the eyes, surrounded by a long, stiff, formal feather, rising from a large rosette of black ribbon on the dexter side."

The sight of such an apparition in a Leicestershire "meet" now-a-days, might be expected not only to astonish the riders, but even frighten the horses from their propriety.

To most English sportsmen Wales is quite unknown as a fox-hunting country; yet there are several packs kept in Pembrokeshire and the two adjoining counties. First, let us remark as to the country, that the enclosures are usually small, the fences consisting of turf walls, from six to eight feet in height; but, though rather formidable in appearance, they are a very safe kind of fence, and a horse accustomed to them jumps on and off with great ease. There are also a good many loose stone walls, and occasionally timber.

A writer in *The Field*, who has evidently been present at some of the "meets" in Wales, begs us to accompany him on a fine morning—say February, as there is always better sport in Wales after Christmas than before—to the "Twmstron Catty Arms," a favourite meet of the hounds, where we shall probably find half-a-dozen pinks, one or two black coats, and a rough-looking farmer, mounted on a rougher pony, without any saddle, waiting for the hounds. Until their arrival he requests us to take a look at the horses and their riders; and we see in the former, well bred, short-legged ones, fit to go in most countries; and, in the latter, true-bred English sportsmen. The hounds now come up; they bear the unmistakable look of fox-hounds, but are somewhat shorter on the leg, and a little more harrier-like about their muzzles and sterns than the generality of English packs. After the usual greetings, the master moves off towards "Penbryn Gorse;" and, on our arriving at the cover-side, instead of a flat furze brake, we find a deep dingle, with a natural growth of furze on either side, with little crags of rock jutting out here and there. The knowing ones quietly cross over to the side on which the fox is likely to break, and the master waves the hounds into the cover, which suddenly becomes quite alive. Presently a whimper is heard, and then a hound opens. "Have at him Goblin!" cries the master, and a burst of merry music answers the cheer. Pug just shows his nose outside the cover, but is headed back; then dismal fears of a "chop" begin to prevail; they are, however, soon dispelled; as, after running round the cover, he breaks away at the upper end: the master sounds a few notes on his horn, and the hounds settle down on the line. "He is away for the rocks," observes a quiet-looking man in black, at the same time charging a big bank; and away we go merrily for nearly four miles, when we find ourselves on the edge of a steep dingle, across which the hounds are streaming. "The Field" here divides; the wiser half follow a gentleman on a bay, who seems to be riding straight away from the hounds. However, he makes a sudden turn, scrambles down the side of the dingle by a narrow path, and reaches the summit on the other side, just as the hounds, which have come to a slight check, hit off the scent again. We then go on for about another mile, jump a big bank, with stiffish wattling at the top, and are then upon the open mountain. But our dangers are not yet over, as we suddenly

see the foremost horse disappear up to his girths in a treacherous peat-bog. On we go, leaving our unfortunate friend to extricate himself as he best can, and pick our way carefully among the boulders, which become rather too plentiful to allow easy galloping. We now see "The Rocks"—a huge volcanic pile, heaped into fantastic shapes—looming in the distance, and Reynard is perceived a little way ahead, gallantly struggling to reach his city of refuge.

The chase now becomes very exciting; the hounds are coursing the fox; but he is within two hundred yards of the rocks; and, if he can but struggle on for a few seconds more, will be safe. However, he is doomed; "Crafty" rolls him over; the rest of the pack rush in; and so dies the poor fox. Only three horsemen are in at the death; but, by the time the animal is broken up, the friends we left in the dingle arrive; and, after a little chaffing, we turn our horses' heads homewards, and agree that forty-five minutes in Wales is not bad sport after all.

In fox-hunting there are frequently taken, by man and horse, leaps which, in moments of less excitement, would literally appal them. On one occasion, Mr. Alex. Campbell, of Monzies, when hunting with Mr. Baker's hounds, cleared, on one of his favourite horses ("Deceiver"), the river Leam, being nine yards and six inches across. Not one of the "field" attempted this daring "fly;" but Mr. Haigh tried it in a much narrower place, and succeeded in landing himself and horse on the right side. Mr. Cambbell's remarkable leap caused not a little commotion in the hunting world; and a gentleman, named Gibson, backed five of his horses for £50 each to clear both places of the Leam—viz., at the spot which was taken by Mr. Campbell, and that taken by Mr. Haigh. These horses, however, were then announced for sale at Tattersall's; and the match had to be made conditionally, that if they were not sold above the reserve price, the match should stand good; and if sold, to be no match. As only one of them was sold, the event stood good with four of the horses; and, after a considerable amount of "beating about the bush," it came off near Granborough—Mr. Martin, of Rugby, being the acceptor of the challenge. Captain Henry Lowndes was umpire. The narrow place was first tried, and all four horses got over, but not without a scramble on landing. The umpire decided that Gibson had won with all four, being £50 each horse. The wide place (Mr. Campbell's "yawner") was then attempted with a grey horse—as noble a looking animal as ever gazed through bridle. With a mass of people facing him on the other side of the river, he gallantly charged it, but fell on the edge of the water, thereby losing the first £50. Had the hounds been in full cry, and nothing to face him, perhaps he would have accomplished the feat. It was, however, a great task to undertake, on the part of the nags, in cold blood. The two next horses were not put to it. The fourth, however, was sent at it in gallant style, but unfortunately jumped into the middle of the water. They were all ridden by one man, who appeared to weigh about 9st.; and, considering that he received a ducking on each occasion, he rode with great spirit and determination. He did not, however, appear to handle his horses as a first-rate *artist*—he seemed "at sea" on one or two occasions with his hands; but a finer seat on horseback could hardly be seen. The match, therefore, ended thus:—Mr. Gibson's horses won over the narrow place, and lost over the wide part: and Mr. Campbell's feat still remains unsurpassed.

The patronage which the chase receives in England is universal. The peer and the plough-boy alike participate in its exhilarating scenes; and even the senator, who sways the destinies of the kingdom, may occasionally be found in the field. The late Lord Palmerston was a great friend to the sport, and not unfrequently, even when premier, might be found joining one of the "meets" in Hampshire, although he had passed the threescore and ten assigned as the period of man's allotted existence in this sublunary world. It is not many years ago, since, at Farley church, he met the Hursley hounds which were thrown into Parnell Wood. In less than five minutes a hound challenged (which summons the huntsman said could not be a mistake). Immediately a view-halloo was given; one ring round the cover, and away they went at a slapping pace over the open, through Mitchelmarsh, nearly down to the "Dog and Crook." There he turned to the left, the *going* hounds

forcing him back over Eldon farm, and then over the open to Compton House, where the fox ran to ground in view, after a good hour and ten minutes—in fact very few were up, the pace being so good, and the country very heavy. A great many of the field here left, being quite satisfied with the above runs; but not so with all; for a fox had stole sway, but Mitchelmarsh Summers got on his line, and was up to him at Parnell, where the first fox was found. He immediately broke by Ashley Hangers, through Ashley Wood, and then took the open over Westley farm, leaving Sparsholt on the right, to Norwood, and then again over the open nearly to Winchester. He then went over the railroad to Abbots Worthy, and took the side of the rail to Hook-pit farm; then again over the railroad, and recrossed it about a mile up, making his point for Pile's farm; then through the Baeley covers to Steching Wood, and from there into Lord Ashburton's large covers at the Grange. It was now half-past four o'clock, and the horses belonging to the huntsman and whipper-in dead-beaten—as was every horse that lived with the hounds—so it was thought prudent to whip off. This concluded a capital day's sport: the last run, from point to point, could not be less than fourteen miles, and the ground run over from twenty to twenty-five miles; time, two hours thirty-five minutes. This is supposed to have been one of the best runs seen in Hampshire; and the first man in England, while we write, commenced the day with the hounds; but whether he was as staunch to the end of the chase as he is to the end of a debate in the House, the *Sporting Chronicle* does not say.

Whilst this indomitable spirit of fox-hunting pervades, more especially, the aristocratic and provincial population of England, it is not less prevalent amongst certain classes of the Scotch. The Linlithgo and Stirlingshire fox-hounds have long enjoyed a high celebrity. One of the most brilliant runs which ever took place in that country occurred when the pack was under the management of the Honourable James Sandilands. The "meet" was announced for Stonebyres. This place, well known to the admirers of natural scenery for its romantic waterfall, and to sportsmen as a sure find for the "gallant varmint," attracted on that day a goodly number, not only of the regular attendants on the hounds, but also of the well-mounted members of a neighbouring hunt.

The morning rose bright, sunny, and dry, no rain having fallen for some time—so much so, that some of those learned in the art "of venerie" even doubted the possibility of sport; but here was a fresh instance that Dame Nature cannot be reduced to scientific rules, for this conjecture was happily frustrated. The hounds having been thrown into the cover, whimpers were heard; but practised hunters doubted their correctness, roe-deer being on foot in the cover, and being subsequently viewed, and many passed round to the south-east part of the Stonebyres' plantation. A farmer suggested a trial of a fine piece of gorse, lying on the side of the hill. The hounds no sooner entered this, than the well-known challenge resounded, and reynard was viewed leaving the gorse at a thundering pace. Onward he went across the Blackhill, making his point in a westerly direction, over a strongly fenced country. The start had been so sudden and unexpected, that many of the field did not get well away with him; the first fence, a good rattling stone wall, on boggy ground on both sides, making several reputed good horses bolt and refuse. Now came the tug of war—now came the chapter of accidents. Some of the "good men and true," going at racing pace, down hill, over ploughed ground, were thrown, horse and man, head over heels. But the pace was too good to inquire after their fate. Horses were seen flying without riders, and with difficulty caught, the gallant huntsman himself not escaping the chapter of accidents. The scent was burning; an almost impracticable fence was ridden at by him; both horse and rider kissed their mother earth: but up and away—the huntsman is of too good stuff to be beaten, though his pluck was severely tried this memorable day, having had three falls. The splendid fox now changed his point, and, crossing the banks of the romantic Nethan water, took a southerly line, and skirting the grounds of Auchtifardlo, towards Mansfield and Netherhouse, on towards Lesmahago. He then tried back down to the water; but finding that dangerous, back he went towards the south. He now crossed the

road, and was then viewed by a man dead beat, and just managed to reach his point—a drain at the foot of the field, close to the village of Lesmahago. Up came the huntsman, who rode brilliantly in spite of the chapter of accidents; and afterwards up came some of the "good men and true," their nags looking awfully beaten and pumped out. The scent had been burning; the pace had been killing; and the time was half-an-hour of as brilliant a thing as had ever been seen in the Carnwath country. It would be invidious to particularise who most distinguished himself in this remarkably fast and brilliant run. Let his laurels rest with him; but gallantry demands that a tribute be paid to the bold riding of a lady well known with these hounds. While the lucky sportsmen, who had managed to come up in the meantime, were taking advantage of the close vicinity of Lesmahago, to procure refreshment for exhausted nature, the gallant pack were endeavouring to dislodge reynard from his temporary retreat in the drain, which having succeeded in doing, he bolted, and, after holding out for ten minutes, he was run into and killed in the streets of Lesmahago, among some children at play; thus affording the most satisfactory of all ends, in a sportsman's eyes, to a fine run. The distance traversed during the run was not less than between eight and nine miles, which, considering the time taken, was about the fastest feat that can be done with hounds.

In this exciting sport it is truly beautiful to see the spirit and eagerness manifested by the young horse when he first feels, as it were by instinct, the nature of the duty he is about to be engaged in. In *The Horse and his Rider*, by Sir Francis Head, Bart., we have this subject graphically narrated. "When a young horse," he says, "that has never seen a hound, is ridden up, for the first time in his life, not to a meet, at which the whole pack are to be seen, but merely to the side of a covert, which, hidden from view, they are drawing, it might reasonably be conceived that, under such circumstances, he could not have an idea of the past, present, or future proceedings—we mean where they had come from, what they were doing, or what they were going to do. However, no sooner does a hound, from laziness, or possibly from feeling that he has been sufficiently pricked by thorns, briars, and gorse, creep out for a few seconds before him, than—'Angels and ministers of grace defend us!'—the young horse pricks up his ears, stares intently at him, holds his breath, and, with a heart beating so hard that it may be not only heard but felt by the rider, he breaks out into a perspiration, which, on the appearance of a few more hounds, turns into a foam as white as soapsuds. On an old hound—by a single deep tone, instantaneously certified by a sharp, shrill, resolute voice of the huntsman—announcing to creation that the one little animal, which so many bigger ones have been so good as to visit, is 'at home,' the young horse paws the ground; if restrained, evinces a slight disposition to rear; until, by the time the whole pack—encouraged by the cheery cry, 'Have at him'—in full chorus have struck up their band of music, he appears to have become almost ungovernable, and is evidently outrageously anxious to do—he knows not what; and, accordingly, when a sudden shriek, scream, or, as the Irish term it, 'screech,' rather than a holloa, from the opposite side of the covert briefly announces, as by a telegram, the joyous little word 'away,' suiting his action to it, 'away' the young horse often bolts with his rider, just as likely 'away' from the hounds as with them. If he follows them, infuriated by ardour, which neither he nor his rider has power to control, he looks at nothing, thinks of nothing, until, at full speed, coming to, say, a stiff fence, he disdains to rise at, a lesson is offered to him which, however, he is a great deal too much excited to learn by heart; and so, before his rider has had time enough to uncoil himself from his roll, the 'young 'un,' without a thought or disposition to wait for the old gentleman, leaves him on the ground to think about the hounds; while, with dangling stirrups, reins hanging loose on his neck, and outstretched neck and tail, he is once again 'up and at 'em.'"

The animal which excites this interest, and calls forth all the energies of both the English sportsman and his horse, is the common fox, the representative of the sub-genus Vulpes, characterised by a linear pupil, and a long bushy tail, and too well known to need a minute description. This wily animal is common in our island, and in most parts of Europe, extending into

Northern Asia, and is everywhere celebrated for its cunning and rapacity. As his linear pupil intimates, the fox is crepuscular, or nocturnal in his habits, but is occasionally seen abroad during the day. In general, however, it is as the dusk of the evening advances that he steals from his burrow, with noiseless steps, to prowl about for prey. His senses of smell and hearing are extremely acute, and he listens, and snuffs the breeze, attentive to every sound, appreciating every odour. His eyes gleam as he creeps along in a crouching attitude, intent upon theft. His movements are all stealthy. He surprises the rabbit gambolling near its burrow; the hare in her form; the poultry on the perch. He slaughters all he can, reserving the overplus for a future exigency, and for that purpose buries it in the earth. In times of scarcity, field-mice, frogs, weasels, and even insects, are devoured. On the continent the fox visits the vineyards, being as partial to the ripe grapes as the jackal is.

He is solitary in his habits, and dwells alone in a burrow, which he has either made or usurped, and which is generally in some secluded situation, not readily to be discovered, and in the neighbourhood of a rabbit-warren, preserves of game, or farms. The female breeds in April, and on her, alone, devolves the entire care of the cubs. She produces three or four at a birth, in a deep burrow, where she has prepared a bed of dried leaves, grass, and moss. The young are very playful, and remain about four months with their parent, who is watchful and resolute to the extreme in their defence. Even when taken at an early age, the fox is not easily tamed, never loses his innate suspiciousness, and never becomes truly domestic. Adults are ferocious when placed in confinement, and soon die. Though slightly made, the fox is very vigorous, and bites with great severity. His powers of endurance and speed have, in this country, recommended him to all lovers of the chase, for whose gratification the breed is preserved, where possible. He has been known to run before the hounds fifty miles at a stretch. When hard pressed, he neither loses his courage nor self-possession, and puts in practice every expedient which cunning dictates to baffle the hounds, or conceal him from their search; and, if all fail, he dies, defending himself to the last, without uttering a cry. His voice is a sort of yelp, which, however, is only occasionally exerted, and never when in quest of prey. It is said by Bewick, and we have often heard it affirmed, that the fox breeds with the dog. We have also seen sharp-nosed dogs, called fox-dogs, and were at the same time assured that they were a cross between the two animals; but it has always so happened that the assertion could not be substantiated.

He who has no larger acquaintance with the oft-decried fox than from having seen him steal away from the covert side, amidst the "whoop" of the huntsman, and the bustle of the "break," or, panting for breath, and besmeared with mud, has beheld him running for life, can have little idea of the beauty of his person in his natural haunts. There, sleek as a kitten, and almost as playful, he really looks a very handsome animal; and, on a still summer's night, when the moon shines brightly, it is delightful to witness his graceful form and nimble motions. He will enter a field, perhaps—but very cautiously—occasionally stopping to see if anything is at hand; and, if not fully satisfied that all is safe, he rears himself upon his hind legs (like a dog in the act of begging), and, erecting his ears, waits for a few seconds, mute as a mouse, eager to catch the echo of the slightest sound. Assured that all is safe, his operations commence. Backwards and forwards over the field he paces; beats over the surface as carefully as a pointer his shooting-ground, and occasionally captures a mouse, or a beetle, to reward him for his patient search. Wherever low willows, oziers, gorse, and thick-bottomed furze abound, the fox is almost sure to be met with. It is generally supposed, and we think upon good grounds, that there are in this country three kinds, which, for the sake of distinction, may be called the Greyhound Fox, the Common Fox, and the Little Red Fox. Most persons who have hunted with fox-hounds cannot have failed to notice the great difference which exists between different individuals, as regards their form, colour, speed, and manners; and there are very few who would not, at a first glance, pronounce them distinct species. Naturalists, however, who have examined them scientifically, regard them as mere varieties; but those varieties are so well marked that they appear

worth describing. The three kinds which exist in Derbyshire are :—

The *Common Fox*, already described.

The *Greyhound Fox*, the form of which resembles that of a greyhound dog. He is larger in size, longer on the legs, more slender in shape, and of swifter speed than the common fox, generally giving faster and more enduring chases. One of these animals has been known to run for four hours before the hounds; and he usually leaves the cover in dashing style. In colour he resembles the common fox, but has almost invariably some grisly or silvery hairs in his coat. His head is large and sharp-looking, rather broad across the cheeks; ears broad and large; nose thin and pointed; and the jet black hairs growing from the upper lip are some of them three inches in length. These foxes are occasionally met with on Charnwood Forest.

The *Little Red Fox* is the third, and is an animal of much smaller size than the common fox. His form is short, compact, and thick, and the colour of his coat red—hence the name. He seems to prefer the oldest covers and woods, and is supposed by many people to be indigenous to Britain, or the one from which the other kinds are descended. When leaving cover he does not gallop off boldly before the hounds, but endeavours to *steal* away cautiously, and frequently affords the best sport, and most protracted runs. For so small an animal his endurance is very considerable, frequently knocking up the best-bred hounds and horses. A Berkshire friend observes:—"I was once with the Craven hounds, and viewed a small red fox away from a piece of gorse, which gave us a run of *sixteen miles from point to point*, without a check, threading woods of five hundred acres, when, at last, she was run into by being caught in a wire. There were only six up at the death, out of sixty or seventy at the meet: and when the second whip went into the wood for the fox, I remarked to Mr. Villebois 'that the fox we found was a remarkably small one, and red;' and, on being brought out, she proved to be the same." This animal is found in some parts of Nottinghamshire, Derbyshire, Leicestershire, and Berkshire.

When the covers in the vicinity of parks have been drawn several times, foxes betake themselves to hollow trees, and endeavour to secrete themselves in the holes and crevices. We remember a brace once climbing a tree nearly twenty feet high, which grew in a slanting direction, and hiding themselves amongst the branches whilst the hounds were beating the brushwood beneath. The bitch displays considerable affection for her young, and, even if hard pressed by hounds, reluctantly leaves the cover where they are situated. In 1842, the Marquis of Hastings' hounds were drawing Staunton Springs, near Calke, Derbyshire, and found a fox, which, for more than an hour, defied all effort to make her break. Several covers having been drawn blank, the huntsman was anxious to get her away, but failed; so, supposing she was a bitch that had cubs, the hounds were whipped off. This proved to be correct; for some pedestrians, who had been following the hounds, stumbled upon the lair by accident, and brought the cubs to show the hunters. They were afterwards taken back, and reared in the wood. Her breeding-place was at the bottom of a thick honeysuckle bush, through which luxuriant herbage had crept, and afforded excellent concealment. A hole, about three feet in circumference, and three inches in depth, was scooped out of the ground; and round the edges of it, dead oak and beech-leaves were ranged. The young were seven in number, shaggy and grotesque-looking objects, four of which had their brushes tipped with white hair.

In the summer of 1842, a bitch fox reared a litter of cubs in the middle of a wheat field, in the parish of Melbourne, Derbyshire. The crop was in full ear when they were discovered, and, being thick and high, afforded them excellent shelter. The spot occupied by the family was on the top of a piece of dry land, and the stems of corn were trodden down and padded close to the earth for many yards. The parents provided a most bountiful table; for, scattered around them, lay no less than two leverets, a young bantam cock, a partridge, the wings of a pheasant, besides the remains of fowls, and a vast profusion of feathers and bones. The novelty of the scene tempted the curious to visit the spot; and the dam led her family away, not quitting the field, however, but concealing them amongst the thickest parts of the crop; and, although eventually reared, they were rarely seen afterwards.

When a bitch has small cubs, and she becomes aware that her nest is discovered, she takes them up one by one in her mouth, as a cat does her kittens, and removes them to a more secure place. The bark of the fox is most frequently heard in January and February; some individuals bark precisely like a terrier giving mouth at game. The food of this animal consists principally of beetles, reptiles, small birds, and rabbits; he will also take partridges, pheasants, fowls, ducks, geese, and even swans. A person who had spent much time in the woods, once told us that, perceiving a fox near a covert side, he stole very cautiously up to him, and found that he was playing with a field-mouse which he had just caught. The same person, once hearing a very unusual noise in the woods, went to ascertain the cause, when he found it to proceed from two foxes, who were quarrelling over a pheasant. One of the animals had captured a prize, of which it was evident the other intended to rob him.

We could fill a large amount of space with anecdotes of the different traits of character exhibited by the fox; but a few must suffice.

A Berkshire gentleman had winged a pheasant, of which his spaniels went in pursuit: he saw it running on the ground; but the pheasant had not gone far before a fine fox caught and ran off with it in his mouth across the open field, and, although the sportsman rated him hard, and the spaniels followed in pursuit, the thief got clear off with his prize. A similar event again occurred in the same copse, and the fox mentioned was undoubtedly the same animal whose audacity was exhibited on the previous occasion. It was evident that the animal was quickly on the alert whenever he heard the report of a gun in the covert, which he frequented, for a long time, unmolested.

In 1849, the *Hull Packet* contained an account of a singular occurrence which took place at Owthorne, near Patrington, in Holderness. "A fine male fox made his appearance amongst a flock of lambs belonging to a widow of that place, and became so much attached to one of the lambs that he could not be driven away. The most extraordinary part of the affair was, that the lamb also declined to be parted from its strange companion, and the pair were seen daily, seldom very far from each other."

Mr. Charles S. Graves relates the following anecdote:—"A curious circumstance occurred at Ingleby many years ago. The hounds were beating the wood opposite the house, when my grandmother heard a great *swearing* amongst her cats in the entrance-hall, and, on going to see what was the matter, found a fox *seated* in the hall; on seeing her he ran along the hall, and down the steps into the cellar, and took his place behind the beer-barrel, where he was secured. No hounds had been anywhere near the house, nor had he been run at all." Foxes are particularly fond of cheese; and fish have been found near their "earths."

Having ventured to digress thus far from our subject, we will return to another description of our hounds.

Formerly two noble varieties of the hound were common in England, which are now seldom seen. We allude to the old English hound and the bloodhound.

Of the old English hound, which is described by Whittaker, in his *History of Manchester*, as the original breed of our island, some years since, there was to be seen a fine specimen in Lancashire. It was tall and robust, with a chest of extraordinary depth and breadth, with pendulous lips, and deeply set eyes; the ears were large and long, and hung very low; the nose was broad, and the nostrils large and moist. The voice was deep, full, and sonorous. The general colour was black, passing into tan, or sandy red, about the muzzle and along the inside of the limbs. Shakespeare's description of the hounds of Theseus, in the *Midsummer Night's Dream*, is true to the letter as referring to this breed, with which he was, no doubt, well acquainted:—

> "My hounds are bred out of the Spartan kind,
> So flew'd, so sanded; and their heads are hung
> With ears that sweep away the morning dew;
> Crook-knee'd and dew-lapped like Thessalian bulls;
> Slow in pursuit, but match'd in mouth like bells,
> Each under each."

THE TALBOT.

Besides the old English, or Southern hound, was the old English stag-hound, or Talbot, a powerful dog, but of lighter form, and more fleet than the former. From this breed has descended the still lighter and swifter fox-hound of the present day. The Talbot was

formerly known as St. Hubert's breed, and was, perhaps the oldest of our slow hounds.

THE BLOODHOUND.

Among the hounds of the "olden time" was the Bloodhound, so celebrated for its exquisite scent, and unwearied perseverance; qualities which were taken advantage of, by training it, not only to the chase of game, but to the pursuit of man. A true bloodhound (and the pure blood is rare) stands about eight-and-twenty inches in height, and is muscular, compact, and strong. The forehead is broad, and the face narrow towards the muzzle; the nostrils are wide, and well developed; the ears are large, pendulous, and broad at the base; the aspect is serene and sagacious; the tail is long, with an upward curve when in pursuit, at which time the hound opens with a voice deep and sonorous, that may be heard down the wind for a very long distance.

The colour of the true breed is stated to be almost invariably a reddish tan, darkening gradually towards the upper parts, till it becomes mixed with the black on the back; the lower parts, limbs, and tail being of a lighter shade, and the muzzle tawny. Pennant adds, "a black spot over each eye;" but some bloodhounds, which were said to have been of the original blood, had not these marks. Some —but such instances were not common—had a little white about them, such as a star in the face, &c. The better opinion is, that the original stock was a mixture of the deep-mouthed Southern hound, and the powerful old English stag-hound.

Our ancestors soon discovered the infallibility of the bloodhound in tracing any animal, living or dead, to its resting-place. To train it, the young dog, accompanied by a staunch old hound, was led to the spot whence a deer, or other animal, had been taken on for a mile or two. The hounds were then laid on and encouraged, and, after hunting this "drag" successfully, were rewarded with a portion of the venison which composed it. The next step was to take the young dog, with his seasoned tutor, to a spot whence a man, whose shoes had been rubbed with the blood of a deer, had started on a circuit of two or three miles. During his progress, the man was instructed to renew the blood from time to time, to keep the scent well alive. His circuit was gradually enlarged at each succeeding lesson; and the young hound, thus entered and trained, became, at last, fully equal to hunt by itself, either for the purpose of wooderaft, war, or "following gear," as the pursuit after the property plundered in a border foray was termed.

Laid on the track of a marauder, it kept up a steady, persevering chase, and was not baffled without difficulty. Sir Walter Scott, in his graphic description of the "stark moss-trooper," Sir William of Deloraine, "good at need," gives, as a proof of his merit, that he

> "By wily turns and desperate bounds
> Had baffled Percy's best bloodhounds."

And the same accomplished knight, his stern nature touched by sorrow at the sight of Sir Richard Musgrave slain, thus eulogises his dead enemy:—

> "Yet rest thee God! for well I know
> I ne'er shall find a nobler foe.
> In all the northern countries here,
> Whose word is snaffle, spur, and spear,
> Thou wert the best to follow gear.
> 'Twas pleasure, as we look'd behind,
> To see how thou the chase couldst wind,
> Cheer the dark bloodhound on his way,
> And with the bugle rouse the fray.
> I'd give the lands of Deloraine,
> Dark Musgrave were alive again."

Sir Walter Scott states that the breed of bloodhounds was kept up by the Buccleuch family on their border estates till within the eighteenth century. In former ages, these dogs, or, as the Scotch called them, "Sleuth-hounds," were kept in great numbers on the borders; and fugitive kings, as well as moss-troopers, were obliged to study how to evade them. Robert Bruce was repeatedly tracked by them, and, on one occasion, only escaped by wading for a considerable distance up a brook, and climbing a tree which overhung the water.

> "Rycht to the burn thai passyt ware,
> But the sleuth-hound made slanting there,
> And waveryt lang time ta and fra,
> That he na certain gait couth ga;
> Till at the last John of Lorn,
> Perseuvit the Hund the sleuth had borne."
>
> *The Bruce*, Book VIII.

"A sure way of stopping the dog," says Sir Walter Scott, in a note to the *Lay of the Last Minstrel*, "was to spill blood upon the track, which destroyed the discriminating fineness of the scent. A captive was sometimes

sacrificed on such occasions. Henry the Minstrel tells a romantic story of Wallace, founded on this circumstance. The hero's little band had been joined by an Irishman, named Fawdon, or Fadzean, a dark, savage, and suspicious character. After a sharp skirmish at Black-Erne Side, Wallace was forced to retreat, with only sixteen followers. The English pursued with a border bloodhound. In the retreat, Fawdon, tired, or affecting to be so, would go no farther. Wallace, having in vain argued with him, in hasty anger struck off his head, and continued the retreat. When the English came up, their hound stayed upon the dead body."

Mr. Boyle, in his *Treatise on Air*, informs us, that a person of quality, in order to ascertain whether a young bloodhound had been well trained, caused one of his servants to walk to a town four miles off, and then to a market-town three miles from thence. The dog, without seeing the man he was to pursue, followed him by the scent to the above-mentioned places, notwithstanding the multitude of market people that went along the same road, and of travellers that had occasion to cross it; and when he came to the chief market-town, he passed through the streets without taking any notice of the people there. He ceased not till he had gone to the house where the man he sought rested himself, and where he found him, in an upper room, to the wonder of those who had accompanied him in his pursuit.

In 1803, the "Thrapstone Association"—a society formed in Northamptonshire for the suppression of felony—procured and trained a bloodhound, for the detection of sheep-stealers. In order to prove the utility of the dog, a man was dispatched from a spot where a great concourse of people were assembled, about ten o'clock, A.M., and an hour afterwards the hound was laid on the scent. After a chase of an hour and a-half, the hound found the man secreted in a tree, many miles from the place of starting.

The Cuban bloodhound, as it is termed, is a dog of Spanish descent, sagacious and savage, and which was employed by the Spaniards with atrocious barbarity in their conquest of America; and, more recently (1795), in Jamaica, against the Maroons, who had revolted, and were waging a bloody and successful war against the government forces, but which the very terror these dogs inspired, at once happily brought to a close.

The dogs used in Cuba in the pursuit of murderers and felons, have a fine scent and great power. Their colour is tan, with black about the muzzle; the ears are comparatively small; the muzzle is shorter and more pointed than in the ordinary hound, and they are shorter on the limbs. In some prints they resemble the mastiff or ban-dog, especially in the form of the head, which approaches that of the bull-dog: indeed, by many, and with reason, they are regarded more as a variety of the mastiff than the hound; and, for ourselves, we hesitate not to regard them as such. They make excellent watch-dogs, and attack both the bull and the bear with determined resolution. Their height at the shoulder is about two feet.

BEAGLE, HARRIER, AND FOX-HOUND.

Several varieties of hounds now exist in our island; and of these, the Beagle, the Harrier, and the Fox-hound are familiar to all our readers. No country equals England in the swiftness, spirit, and endurance of its hounds; and in no country is so much attention paid to the different breeds, especially the harrier and fox-hound. The beagle was formerly a great favourite, but is now little used. It is of small stature, but of exquisite scent, and its tones, when heard in full cry, are musical. It has not, however, the strength or fleetness of the harrier, and still less of the fox-hound, and hence it does not engage the attention of the sportsmen of the modern school, who, unlike Sir Roger de Coverley, are impetuous in the field, preferring a hard run to a tame and quiet pursuit. The beagle was only employed in hunting the hare, as is the harrier; but the fox-hound is trained both for the deer and the fox. The strength and powers of scent of the fox-hound are very great, and many astonishing instances of the energy and endurance of these animals are on record.

The cost of keeping a pack of harriers, or beagles, varies according to modes and means; also according to the nature of the country in which they are maintained. In Ireland, for example, all things being equal, a pack would be kept at a cheaper rate than a similar pack might be expected to be in England. This,

however, is not always the case; and a great disparity appears in the different sums expended by different individuals in the keeping of their harriers or beagles. For example, we have heard of the owner of twelve couples of good working harriers, keeping them at a comparatively inconsiderable outlay His plan was this:—He laboured to encourage a hunting spirit in his neighbourhood, and to get his hounds kept at the different villages or farm-houses. He employed a good pedestrian huntsman at 3*s.* a day, for two days in the week, to collect and hunt the hounds, and divided the hares killed between themselves and the different farmers whose grounds he hunted over; and then, at the close of the season, gave to themselves and the watchers and gamekeepers a good jollification, in the shape of a hunt-supper; and, occasionally, after a good run, quenched the thirst of the parishioners by a gallon or two of ale. This plan he found to cement their good feeling towards the hunt, and to have a great tendency to preserve the hares, whilst the hounds were always kept strong in scent, wind, and limb; and, as he kept a horse and strong pony, he made those useful, both for hunting, hacking, and harness, and could, even then, pop in an occasional day, by having an extra gallop with an adjoining pack of fox-hounds; and if he found that he was putting too hard upon horse-flesh, he could then spare them, and go after his harriers an occasional day on foot. If a man can do without the parade of huntsmen, whips, and all the concomitant *et ceteras*, he would not only find it a very great saving of expense, but add materially to his sport, the annual expenditure of which would not cost him more than £50. In carrying out this plan of economy, hounds should not exceed eighteen inches; and they should be encouraged in a morning scent, and to do their own work without being interfered with. By this means hounds are encouraged to self-perseverance, and to stick close to each other. A small kennel, to rear puppies, should be got, till they are fit to be billeted abroad; and they should be bred from faultless hounds, with good-toned voices

The economy of this mode of keeping a pack of harriers is certainly very great, and, we have no doubt, both much sport and much satisfaction could be derived from it; but, of course, much of these would depend on the state of the purse, and the physical constitution and mental organism of him who would follow it. In Ireland, a pack of harriers may be kept at much less expense than in England, even though there is in that country an additional degree of parade exhibited in accompanying the pack. A gentleman sportsman, in replying to a query on this subject, thus describes his mode of maintaining his pack:—

"The query is, the probable expense of keeping from twelve to fourteen couple of harriers, to hunt two or three days a week. In endeavouring to answer this question, I must assume that the querist is living in Ireland, as I know nothing of the prices of the various necessaries in either England or Scotland. To come at facts, however, fourteen couple of hunting-hounds will consume very nearly half a ton of oatmeal in a month, which, at the average of prices in this country (15*s.* per cwt.), would amount to £90 per annum for meal; then comes carrion, from 2*s.* 6*d.* to 5*s.* a carcass, for a year's consumption, of which it would be impossible for me to state any fixed sum, the supply being so precarious; but, for my own part, I always take as many as I can get, feeling, as I do, how much it lightens the meal bill, and adds to the condition of the pack. Straw is the next item, and from £10 to £15 might safely be put down as not too much for this. Now for servants' wages. I pay my whipper 7*s.* a week, with board, lodging, and clothes, for which consideration he grooms one of his own horses entirely, and keeps an eye to the other; feeds and exercises the hounds, and is responsible in the same way as a kennel huntsman for the general management of the hounds: indoors, under him, there is a boiler (as we call him), at 5*s.* per week, who, as his name implies, boils the mess, cleans the kennel, &c., &c.; he, again, has the assistance of another boy every morning, to wash out the kennels—which, if well done, is rather a troublesome business. I do not consider a kennel could be kept decently with less help; and, of course, if the proprietor does not act as huntsman himself, he must expect his wages bill to be higher; and I doubt not some English readers will smile at what we consider very fair wages, and for which we get our work right well done. I

have now, I believe, only ommitted one item, and one in which the less is spent the better —viz., drugs. Sulphur is always requisite, and the supply should never be allowed to run short; and in the summer season, the ingredients requisite for dressing the pack must, of course, be procured—along with any other requisites, which the sum of £10 ought amply to provide. Fuel—as the price and convenience of obtaining this differ so materially, that in some places it forms an expensive item, while in others it is always ready to hand—I must leave your inquirer to judge for himself what addition it would form to his expenditure, merely informing him that there is no getting on without it. In my own case, using, as I do, logs of wood which I have not to buy, I consider from £8 to £10 covers the cutting and carriage. Now for the summary of the expense: meal, £90; carrion, £5 (I state a low sum for this, as I consider if a full supply of it is obtained the meal bill will be proportionately reduced); straw, £15; physic or drugs, £10; fuel, £10; wages of whip and boiler, £31 4*s.*; a man for one quarter of a day throughout the year, £4 11*s.* 3*d.*, at the rate of 1*s.* per diem. To this should be added the board, lodging, and clothing of the whip, with the lodging of the boiler.

"By this it will be seen that the keep of fourteen couple of harriers stands me in the sum of £165 15*s.* 3*d.* in the year. I may, perhaps, be a little high in putting down half a cwt. per month of meal; but, if I am, it will be found that there are many little sundries that will fully balance my tax. In conclusion, I must add that, save in the meal bill, little difference would be felt between the keep of fourteen couple and twenty couple; whereas I firmly believe no fourteen couple of hounds (I speak of this country) could hunt three days a week through a season. I now come to a very important part of the question, viz., the expense of getting up a pack of hounds—a subject upon which I can speak from experience, as I smarted pretty considerably during my apprenticeship. I will merely state the facts as they appear in the kennel-ledger, as follows:—£3, £30, £18, £5, £11, £60 10*s.*, in all a sum of £127 10*s.*, for which consideration I got 34½ couple of hounds; to which sum I should make a very large addition for carriage, as I got them from all parts of England; 11½ couple I was made a present of; making, in all, 46 couple. Since what I call the purchasing era has passed, I have reared 32 couple of puppies; and now I can take into the field as fair and evenly-matched a pack as ever frightened the life out of the boldest reynard that ever skirred a country."

So much for Ireland; and with one more example of, and a few comments on harrier-keeping in England, we will close this part of our subject. A practical sporting gentleman, writing on the same theme, gives, from his own personal experience, the expense necessary to carry on a hunting establishment of from twelve to fourteen couples, to go out two or three times a week, and also the expense of building kennels, &c. "Having kept a pack of hounds, consisting of twelve or fourteen couples," he says, "and having built kennels for them, I know pretty well the £ *s. d.* items connected with such an establishment. In the first place, hounds cannot work more than three times a week. Hounds require hunting twice a week to keep them steady and in good condition; but more than this it is unreasonable to expect from them. To hunt twice a week will entail the expense of four horses—two for the huntsman, and two for his whip. These, with good management and ordinary luck, will see him through a season; but, in case of accident, I should recommend him to commence the season with five horses, which will render him completely master of his work. Nothing, in my opinion, is so great a drawback to sport as to be under-horsed; and it must ever be borne in mind that hunting harriers is far more trying to horses than hunting fox-hounds; and no man can make the best of his day's sport who does not ride close with his pack in all their turnings. The expense of horse-keeping will amount to something like £45 a horse per annum. This item will, consequently, be £225. The keeping of thirteen couple of harriers will cost, in oatmeal and flesh, something like £100 per annum; a boy, to boil flesh and attend to the pack, at 7*s.* per week, £18 per annum; taxes for horses and hounds, something like £27; and sundries, which are at all times heavy when horses and hounds are kept, £25—thus making the yearly expense something like £395. Your kennel,

with a small boiling-house attached, may be built, with necessary convenience, for about £70. And here I would make a remark. Let the kennel and yard be placed on well-drained ground, and the floor laid on at least twelve inches of chalk, or stone of some sort, as nothing brings about kennel lameness so much as damp floors; and, if once among your hounds, the trouble is incalculable, as it hangs about like a plague. In conclusion, I strongly recommend the purchasing of a pack that have been accustomed to work together, even if the first outlay seem large. I recommend this, as I am fully convinced that no plan is so unsatisfactory, and, in the long run, so expensive, as getting draughts from different lots. It entails on you the faults of every pack you procure them from; and you will be years before you have anything like a useful lot."

These estimates, especially the last, are, in the opinions of some, too high, for it is said dogs do not require palaces. Perfectly dry and well-aired barns, byres, or outhouses, and plenty of sweet straw, are all the requisites for amateur packs. Twenty couple of small beagles, to a man who has the ordinary number of servants about him, will cost but a trifle, if he can afford at all to have the luxury of a small sporting establishment. Extravagance, display, and want of care and knowledge to be economical, and overdoing things, are the great causes of things remaining undone, and why we have not half the sport which, with economy, we might have. Like the frog in the fable, we swell ourselves out till we burst; hence most of our failures, and the constant annual abandonment of mansions and manors, horses and hounds, dogs, guns, and field sports, and, often, of our country and home. No one would find fault with well-spent liberality; but it is the tomfooleries and need-nots that are at the root of the mischief, and not liberality and just expenses. Besides, how true it is that extreme selfishness and extreme prodigality often meet in the same person. Where money ought to be judiciously and liberally expended, how frequently is it withheld. Underpaid keepers; no food allowed for pheasants in the winter; no proper quantity of traps; no watchers in the egg and breeding season, and at other important times; no proper allowances or food for dogs, or of powder, shot, &c.; shepherds and farm-labourers looked upon as rascals—ungenerous and suspicious espionage exercised over them; no little *douceurs* of money, tea, or clothing to them and their wives and families; in fact, we might enumerate a whole catalogue of petty omissions which are made by men who pretend to have money and to sport, and of which they ought to be ashamed. Where is the tenant-farmer's remuneration and compliments of the season? Too often in the river Lethe. You may have palaces for stables and kennels, expensive shooting-boxes, a useless staff of idle and inefficient servants, and great general personal expenditure, and the sport—the hobby—which should be the first consideration, becomes the last.

But back to the beagles, which we will assume you have, and that you have already dry housing convenience for them, and an active and intelligent man (partially employed on other things, because the beagles will not fill up his time), who can ride or run well, and has a good notion of hunting—you need not go to any expense on those heads, except a gratuity at Christmas of £5 in addition to his wages; and your dog-keep will cost you fourpence a week each. Then there will be straw, travelling expenses if you leave home, gratuities, dog-tax, &c., in addition; but we feel satisfied that we could, if close at home, keep and hunt a pack of small beagles for a mere trifle. By the way, larch and red-deal sawdust, well dried, and used as beds for dogs, is an effectual remedy against fleas and ticks.

Perhaps one of the most extraordinary instances of cheap dog-keeping is furnished in the case of a Mr. Osbaldeston; and although it was not harriers he kept, but fox-hounds, it may be that some humble, but enthusiastic lover of sport may take a hint from it, and become a keeper of dogs, even in the centre of the great metropolis. "With half-a-dozen of children," says the *Sporting Anecdotes*, "as many couples of hounds, and two hunters, this Mr. Osbaldeston, clerk to an attorney, kept himself, family, and these dogs and horses, upon a salary of £60 per annum. This, also, was effected in London, without running into debt, and with always a good coat on his back. To explain this seeming impossibility, it should be observed that, after the expiration of the office hours, Mr. Osbaldeston acted as an

accountant for the butchers at Clare Market, who paid him in offal, the choicest morsels of which he selected for himself and family, and with the rest he fed his hounds, which were kept in the garret. His horses were lodged in the cellar, and fed on grains from a neighbouring brewhouse, and on damaged corn, with which he was supplied by a corn-chandler, whose books he kept in order once or twice a week. In the season he hunted, and, by giving a hare, now and then, to the farmers over whose grounds he sported, he secured their good-will and permission; and several gentlemen, struck with the extraordinary economical mode of his hunting arrangements, which were generally known, likewise winked at his going over their manors. This Nimrodian was the younger son of a gentleman of good family, but small fortune, in the north of England, and having, imprudently, married one of his father's servants, was turned out of doors, with no other fortune than a southern hound, big with pup, whose offspring, from that time, became a source of amusement to himself."

The animal mostly hunted by harriers is the common hare, which is found throughout Europe, and, indeed, in most of the northern parts of the world. Being destitute of weapons of defence, it is endowed by Providence in a high degree with the sentiment of fear. Its timidity is known to every one: it is attentive to every alarm, and is, therefore, furnished with ears very long and tubular, which catch the remotest sounds. The eyes are so prominent as to enable the animal to see both before and behind.

The hare feeds in the evenings, and sleeps in its *form* during the day; and, as it generally lies on the ground, its feet are protected, both above and below, with a thick covering of fur. In a moonlight evening many of the species may frequently be seen sporting together, leaping about and pursuing each other; but the least noise alarms them, and they then scamper off, each in a different direction. Their pace is a kind of gallop, or quick succession of leaps; and they are extremely swift, particularly in ascending high grounds, to which, when pursued, they generally have recourse: here their large and strong hind legs are of singular use to them. In northern regions, where, on the descent of the winter's snows, they would (were their summer fur to remain) be rendered particularly conspicuous to animals of prey, they change their yellow-grey dress in the autumn, for one perfectly white; and are thus enabled, in a great measure, to elude their enemies.

In more temperate regions, they choose, in winter, a form exposed to the south, to obtain all the possible warmth of that season; and in summer, when they are desirous of shunning the hot rays of the sun, they change this for one with a northernly aspect: but in both cases they have the instinct of generally fixing upon a place where the immediately surrounding objects are nearly the colour of their own bodies.

In one hare that a gentleman watched, as soon as the dogs were heard, though at the distance of nearly a mile, she rose from her form, swam across a rivulet, then lay down among the bushes on the other side, and by this means evaded the scent of the hounds. When a hare has been chased for a considerable length of time, she will sometimes push another from its seat, and lie down there herself. When hard pressed, she will mingle with a flock of sheep, run up an old wall, and conceal herself among the grass on the top of it, or cross a river several times at small distances. She never runs in a line directly forward; but constantly doubles about, which frequently throws the dogs out of the scent: and she generally goes against the wind. It is extremely remarkable that hares, however frequently pursued by the dogs, seldom leave the place where they were brought forth, or that in which they usually sit; and it is a very common thing to find them, after a long and severe chase, in the same place the day following.

The females have less strength and agility than the males: they are, consequently, more timid; and never suffer the dogs to approach them so near, before they rise, as the males. They are likewise said to practise more arts, and to double more frequently.

This animal is gentle, and susceptible even of education. He does not often, however, though he exhibits some degree of attachment to his master, become altogether domestic: for, even when taken very young, brought up in the house, and accustomed to kindness and

attention, no sooner has he arrived at a certain age, than he generally seizes the first opportunity of recovering his liberty, and flying to the fields.

While Dr. Townson was at Göttingen, he had a young hare brought to him, which he took so much pains with as to render it more familiar than these animals commonly are. In the evenings, it soon became so frolicsome, as to run and jump about his sofa and bed: sometimes in its play it would leap upon him, and pat him with its fore feet; or, while he was reading, even knock the book out of his hand. But whenever a stranger entered the room, the little creature always exhibited considerable alarm.

Mr. Borlase saw a hare that was so familiar as to feed from the hand, lie under a chair in a common sitting-room, and appear in every other respect as easy and comfortable in its situation as a lap-dog. It now and then went out into the garden; but, after regaling itself, always returned to the house as its proper habitation. Its usual companions were a greyhound and a spaniel; both so fond of hare-hunting, that they often went out together, without any person accompanying them. With these two dogs this tame hare spent its evenings: they always slept on the same hearth, and, very frequently, it would rest itself upon them.

Hares are very much infested with fleas. Linnæus tells us, that cloth made of their fur will attract these insects, and preserve the wearer himself from their troublesome attacks. It is much hunted in almost every country.

"Poor is the triumph o'er the timid hare!
Yet vain her best precaution: though she sits
Conceal'd with folded ears; unsleeping eyes,
By nature rais'd to take th' horizon in;
And head conceal'd betwixt her hairy feet,
In act to spring away. The scented dew
Betrays her early labyrinth; and deep
In scatter'd, sullen openings, far behind,
With ev'ry breeze, she hears the coming storm:
But nearer, and more frequent, as it loads
The sighing gale, she springs amaz'd, and all
The savage soul of game is up at once."

In India the hare is hunted for sport; not only with dogs, but with hawks, and some species of the cat tribe. The flesh was regarded by Moses as unclean; and, though in esteem among the Romans, was forbidden by the Druids, and by the Britons of the early centuries. It is now, though very black, dry, and devoid of fat, much esteemed by the Europeans, on account of its peculiar flavour.

Mr. Greiff, in his work on Sweden, makes some pertinent remarks relative to the chase, and the natural history of the hare in that country: —

"The hare hunt, with the harriers so called, or the common hounds," he says, "is one of the pleasantest sports; but, if you do not wish to be deprived of this sport in course of time, you ought not to prosecute it at all seasons of the year. It is true that the female brings forth young three times, from March to June inclusive, and has seven to eight young each time; but the mother's indifference for her young, and the many kind of persecutions they are subject to, are the cause that few grow up. The female never places the young ones in one place, but one here, another there, and perhaps visits them only two or three times, and perhaps never. I have, however, found three under the same bush; but, as it was during a hunt, it is possible that the parturition was hastened by the chase. Besides man, who shoots and catches, the hare's enemies are the wolf, fox, dog, cat, eagle, eagle-owl, hare-owl, and hawks of different sorts. In wet and rainy weather, midges and insects fasten themselves about the eyes of the young hare, and inflame them so, that worms are bred, and entirely consume them. In the bare winter, or, in other words, if the ground be not covered with snow, his white skin betrays him. From March to August the hunting of the hare should be continued with moderation; it is likewise necessary, for the breaking-in of the hounds, to let them hunt by the scent. A prudent and old sportsman never shoots the female at that period; and if a few males are shot, it does no harm. The female is generally larger, carries herself high when she runs, and makes small bounds; the male is little, runs low, and makes wide bounds.

"It is asserted that old male hares kill the young ones; but, I believe, the case is the same with this as with other animals — that when any of them get a good station, the strongest drive the weakest from it. In the spring, it is easiest for the dogs to get them up; and, as the males ramble both night and

day, one can often find four or five with one female. The old hares are called ramblers, in the spring, when they stroll about to great distances to seek for the females. If the dogs run after one to a great distance, and the place of finding is left quiet, it is certain that the others will return to the same place. About Midsummer is the most difficult time to get them up, when the juniper-bush is in bloom, and all flowers throw out such a strong scent: the hare, also, does not require to go far for food. I have often seen, by the dew in the fields, and in the wood, that he has not moved ten steps round about; when he has hit upon buckbean (wattwäppling), or any other palatable food. In autumn and winter, the hare sits close; but in October and November the dogs can easily enough get him up. It helps, as they say, to get the hare on foot, by shouts, shots, and rattles. One may very well use five or six, or even a greater number of dogs.

"When they can be tracked on the snow, only one dog should be used, as several destroy, for each other, the track of the hare when she springs off; they are also an impediment to the sportsman while he is ringing, by frightening the hare from her seat. In autumn, the hare frequents the open country, and grounds covered with small juniper bushes; and when the snow falls, it sits sometimes in the snow-drifts, and in the furrows of corn-fields. When it is hard weather, it will sit two or three nights without going from its seat. During a thaw, it sits often on stones, and in open places; but in severe cold, in thickets and bushes. If the country for tracking will permit, that is to say, if it be sufficiently open, it is more convenient, to ride about and search for its track along the fence of corn-fields, as it goes in and out; for, to follow all the windings and turnings which it makes in the course of the night, is both fatiguing and consumes time. As long as you find the track of the hare to be so that the back feet immediately follow each other, it is a proof that it has no inclination to rest; but when it begins to go backwards and forwards in the same track, and makes one or two leaps, and sets all its four feet together almost in one point, it is certain that you have it very near, and the time has arrived not to follow the track more, but to ring it immediately. If it has gone farther than the first ring, you must make a new one. Whilst performing this operation, the sportsman should not halt, as then the hare rises easily from its seat. When it is ascertained that it has sprung up, the dog is immediately to be let loose. The hare is caught with snares in fences, or, with the usual gins, in woods and hedges. Roasted, it —especially a young hare—makes a good dish at table."

In speaking of the hare, in another part of his work, Mr. Greiff says—"At a hunt, when a female hare was shot, seven young ones, all alive, were cast to the dogs; a bitch which had lately pupped, took one of the young ones, laid it in a bush, and licked and dried it; and we sportsmen had a difficulty to get it from her, as she constantly licked and caressed it, as if she wanted to give it suck. It was carried home, and fed with milk. Eight days afterwards it was killed, by an unlucky accident, to the great mortification of all the hunting party."

In the chronological history of Great Britain, hare-hunting takes precedence of fox-hunting. "Hare-hunting," says a writer in the *Encyclo. Brit.*, "claims precedence of fox-hunting in the sporting chronology of Great Britain, and, we believe, of all other countries, inasmuch as a hare has always been esteemed excellent eating; and a fox the rankest of carrion. We gather from Xenophon that it was practised before his day, and he wrote fully upon it above three centuries before Christ; both hounds and nets being then used in the pursuit. Neither can we marvel at hare-hunting being the favourite diversion in all nations given to sporting, where the use of the horse in the field had not become common. But we will go a point farther than this, and assert, that how inferior soever may be the estimation in which hunting the hare is held in comparison with hunting the fox, no animal of the chase affords so much hunting as she does." In this we concur; and Mr. Beckford agrees with us, for he says, that "the hare, when properly hunted in a good country, will show more hunting, to those fond of seeing hounds hunt, than any other animal." In an *Essay on Hunting*, by the County Squire, he says—"The chase after the fox or stag is

violent, and little more than riding, or running; but the hare displays the very *art* of hunting—she affords a pleasure worthy of a philosopher—a curiosity that may justly raise the admiration of the wisest statesman, physician, or divine. I, therefore, hope for pardon from my more sprightly brethren, if I give my voto for the innocent hare above all other game."

The hare is a very prolific animal, and, were it otherwise, the race would soon become extinct, from the numerous enemies by which it is sought and assailed. The average duration of the hare's life is about seven years. It is pursued by dogs and foxes with mortal and unrelenting antipathy. Weasels, wild cats, and wolves, seize and devour it whenever it is within their reach; and eagles, hawks, and other birds of prey are also destructive enemies; but the most formidable of all is man. If taken young, it may be tamed and domesticated. It has occasionally been suckled and nursed by a cat.

Mr. Beckford, an excellent sportsman, makes many valuable remarks upon the harrier and the hare, and thinks that it is a fault in the former to run too fast. Scope should be given for all the little tricks of the hare, nor should she be killed foully. She will make a good defence when fiercely hunted; and, as far as her own safety is concerned, the hare has more cunning than the fox, and makes use of shifts to save her life far beyond all the artifices of the other. The County Squire, another good authority upon this subject, says, in reference to hare-hunting:—"I would advise a young huntsman, when the scent is well, always to keep himself far behind. At such a time, especially, if it be against the wind, it is impossible for the hare to hold forward, nor has she any mode of escaping, but to stop short, and, when all are past, to steal immediately back. This is often the occasion of an irrecoverable fault in the midst of the warmest sport; and is the best trick the hare has for her life in scenting weather. If the huntsman, therefore, is not too forward, he will have the advantage of seeing her manœuvre, and of assisting his hounds at this critical moment. Upon sight of the hare, avoid, above all things, the vile practice of hallooing hounds off a scent to lay them on after a view. It not only spoils the dogs, by accustoming them at every fault to listen for and expect the halloo, but it is foul sporting; equally unfair, and to be condemned, to suffer the pricks of the hare's footing to be sought for when she runs the foil; for, although it is admitted that, by such pricking and discovering her steps, no hare can escape, yet it is an unmanly mode of assisting hounds, which no huntsman, who is a sportsman, will be guilty of himself, or condescend to make use of when done by others. The huntsman should never be noisy when a hare is first started; let him not only check his own forwardness, but that, likewise, of the inexperienced sportsman. Hounds are apt enough, in the first heat of their mettle, to overshoot their game, and hours of sad sport have happened from driving them too fast. Too many people think a chief part of hunting consists in hallooing loud and riding hard; but they are mistaken, and must not be offended should the huntsman swear at such practices. No tongue can be allowed but his, nor, at this particular time, ought any one to be more forward. The chief considerations for the huntsman, when the hounds are at fault, are, how long the hare has been on foot, and how far the hounds make it good; if she has not been long, and hard pressed, he must expeditiously try a wide circle, and so persist in contracting his circles, until he returns to the place where the dogs threw up. Should the hare have been driven hard, or be nearly dead run, the huntsman need only try a small compass, and that slowly and cautiously, for she will only leap off a few rods and *squat*, until one or other of the dogs jumps upon her. A huntsman should be careful of talking too loud to hounds, and in a key which, instead of cheering, confounds them."

In reference to the huntsman, the same authority says—"Give me a fellow of everlasting patience and good temper, who does not consider hunting merely as his business, but who naturally loves it; one with a clear moderate voice, that speaks to an old hound when at fault, frequently and with quickness, and entices him in a tone that enforces courage, and induces him to stoop perpetually to recover the scent. It is by no means the huntsman's business, by pricking the hare, to hit her off; in the first place, it is unfair; and, secondly, while he is poring with his eyes upon the

ground, not one in twenty of the hounds will have his nose to it. If there is a long default, the huntsman should attend to the tender-nosed dog, which, perhaps, he disregarded in the morning as a babbler, and whom he pronounced worthy of a halter for opening at nothing; his superior excellence of scenting may now show itself to have merited a different judgment, and may encourage some stancher hound to stoop, which he would not otherwise do."

Mr. Beckford, in a great measure, coincides with these remarks, and jocularly observes—"Were it customary to attend to the breed of huntsmen, as well as to that of hounds, the family of the *silent gentleman*, mentioned by the *Spectator*, would furnish an excellent cross; and that a female of his lineage, married to a knowing huntsman, would probably produce a perfect hare hunter."

It is said, that a hare generally describes a circle in her flight, either larger or smaller, in accordance with her strength; and that the female does not make so large a *détour* as the male hare. Either sex, however, when, having been hunted, and yet escaped, whether by having made large or small circles, will follow nearly the same track again when pursued; much, however, will depend on her general habits, and whether the country be open or enclosed. In inclosures, and where there is much cover, the *dodges* of the hare form a complete puzzle to the hounds. Besides running the foil, she frequently makes doubles, which is going forward to tread the same steps back again, purposely to confuse her pursuers; and the same style in which the first double is made, she generally continues to follow, whether long or short.

We will not prolong this part of our subject, but conclude it by giving Mr. Beckford's opinion on the harrier *pack* individually and collectively. "The number of hounds," he says, "should not exceed twenty couple in the field, from the difficulty of getting a greater number to run well together; and a pack of harriers (as well as fox-hounds) are incomplete if they do not. A hound that runs too fast for the rest ought not to be kept. Some huntsmen load them with heavy collars, or tie a long strap round their necks; a better way would be to part with them; whether they go too slow or too fast, they ought equally to be drafted. The hounds most likely to show sport, are between the large slow-hunting harrier and the little fox-beagle; the former are dull, heavy, and too slow; the latter are lively, light, and too fleet; the first sort have the best noses, and will kill their game at last, if the day be long enough; the other, on the contrary, dash and are all alive, but every cold blast affects them; and in a deep and wet country, it is not impossible that some of them may be drowned." He further observes—"that with great trouble, and by breeding, for many years, a vast number of hounds, he has succeeded in his endeavour of getting a cross of both kinds, with great bone and strength, into as small a compass as possible; that they were handsome, ran well together, had all the spirit that could be wished, and would hunt the coldest scent. In conclusion, harriers to be good, must be kept to their proper game."

THE ENGLISH POINTER.

This dog is produced by a cross between the fox-hound and the Spanish pointer, a large, big-boned hound, high in his legs, with a deep jowl, and very heavy ears. This dog is now seldom seen; like the Talbot, the source, as we presume, of the light, active, but vigorous fox-hound, the old Spanish pointer has merged into the intelligent, vigorous dog, so much prized by the sportsman for its excellent qualifications. In some breeds of pointers there is, we believe, a cross of the fox-hound, which improves their strength and energy.

The intelligence of the pointer, and the occupation in which he is so much engaged, has rendered him capable of judging between the qualities of a good and a bad shot. Capt. Brown relates the following anecdote on this subject:—"A gentleman having requested the loan of a pointer dog from a friend, was informed by him that the dog would behave very well so long as he could kill his birds; but if he frequently missed them, the dog would run home and leave him. The pointer was accordingly sent, and the following day was fixed for trial; but, unfortunately, his new master happened to be a remarkably bad shot. Bird after bird rose and was fired at, but still pursued its flight untouched, till, at last, the dog became careless, and often missed his

game. As if seemingly willing, however, to give one chance more, he made a dead stop at a fern bush, with his nose pointed downward, his fore foot bent, and the tail straight and steady. In this position he remained firm till the sportsman was close to him, with both barrels cocked; then, moving steadily forward for a few paces, he at last stood still near a bunch of heather, the tail expressing the anxiety he felt, by moving regularly backwards and forwards. At last, out sprung a fine old blackcock. Bang, bang, went both barrels—but the bird escaped unhurt. The patience of the dog was now quite exhausted, and, instead of dropping to the charge, he turned boldly round, placed his tail between his legs, gave one howl, long and loud, and set off as fast as he could to his own home."

These dogs have been known to go out hunting by themselves, and if they *found*, to return for their master, and, by gestures, induce him to take his gun, and follow them to the spot. This peculiarity, however, is not confined to them.

As Reynard kills his own mutton, as the phrase is, and supplies his own larder with rabbits, seldom destroying game, or visiting distant hen-roosts when there is an abundant number of bunnies close at hand, and following his own impulses without let or hindrance; it may possibly be excused if a pack of hounds, carrying out the idiosyncrasy principle, should get up a run to themselves, without either the voice of the huntsman to cheer them onwards, or the thong of the whips to keep them well together. A case of this description took place with the Essex Union hounds. Tired of the inaction of the kennel at Danbury, and anxious for the exercise of their good qualities as a famous pack, they managed to burst from their bounds, and commenced a chase upon their own account. They collected in a compact body, and, under the guidance of the leader of the pack, they drew the cover in the immediate neighbourhood of the common; and, having speedily found a fox, they went off in full cry, and proved that they were adepts at their work. An alarm was given; and it was not till the huntsman and whips had had a chase of three-quarters of an hour, that the truant pack were drawn off the scent, and brought safely back to the captivity of the kennel.

All these animals are very superior in the scent; but, according to the lines of Tickell, they must yield in this particular to the Talbot, or bloodhound.

"O'er all the bloodhound boasts superior skill,
To scent, to view, to turn, and boldly kill;
His fellows' vain alarms rejects with scorn,
True to the master's voice, and learned horn.
His nostrils oft, if ancient fame sing true,
Trace the sly felon through the tainted dew;
Once snuff'd, he follows with unalter'd aim,
Nor odours lure him from the chosen game;
Deep-mouth'd he thunders, and inflamed he views,
Springs on relentless, and to death pursues."

Before the beginning of the present century pointers were known in Great Britain, and are now abundantly spread over these islands. They have also been transported to our colonial possessions, where it is to be hoped the breed may be perpetuated, although we fear that the want of hunting opportunity will cause them to degenerate. We have records of some of the species having exhibited traits of excellence of the very highest order. "The *celebrated* pointer dog Dash," says Mr. Blaine, "so admirably portrayed by Gilpin, was the produce of a Spanish pointer and a fox-hound; and the blending of the high scenting powers of the Spanish pointer, and the dash, speed, and courage of the fox-hound, produced one of the best pointers that ever crossed a field, or ranged a moor, either as regarded speed, endurance, and such scenting powers as carried him, at once, up to the birds, with little quartering of the ground. He was equally good at backing, which he did in a style that gained him great admiration. It is recorded that he was sold by his master, Colonel Thornton, to Sir Richard Symons, for 160 pounds' worth of Champagne and Burgundy, a hogshead of claret, a valuable gun, and a pointer. The bargain was also made with a stipulation, that if any accident happened to him, he was to be returned to Colonel Thornton for fifty guineas. It appears that Dash did break his leg, which unfitted him for any purpose but that of breeding from, and likewise that the sporting colonel gladly received him back again for the stipulated sum."

It is impossible for any one to estimate the qualities of dogs who has not witnessed their development, correctly, or even sufficiently. Dr. Shaw tells us that the French academi-

cians speak of a dog of Germany, which, in a manner, is perfectly intelligible, and would call for tea, coffee, chocolate, &c. The person who evidenced the qualities of this dog, and who communicated an account of them to the Royal Academy of France, was no less than the distinguished Leibnitz—one not likely to form a hasty opinion, or coolly report an untruth. The dog, however, had been educated to his mode of *speech*. A little boy, the son of a peasant, imagined that he perceived in the voice of the dog the rudimental resemblance to certain words, and, therefore, took it into his head to teach him to speak. With this object in view he set to work, and spared neither time, labour, nor patience upon his canine scholar, who was about three years old when his education in the German language commenced; and he soon made such progress, that he could articulate, with some degree of distinctness, no fewer than thirty words. It appears, however, that he was somewhat of a truant, and was negligent in the exertion of his extraordinary talents—a circumstance very common, even in men of conscious ability. He was averse to his being pressed into the service of literature; so that it was necessary that the word should be first pronounced to him each time, which he, as it were, echoed from his preceptor. Leibnitz, however, attests that he himself heard him speak; and the French academicians add, that unless they had received the testimony of so great a man as Leibnitz, they should scarcely have dared to report the circumstance. This extraordinary dog was a native of Zeitz, in Misnia, in Saxony. Had this dog been a native of Japan instead of Germany, to what a degree of consideration would he not have risen! The islands of that empire form the earthly paradise of dogs. There they have every encouragement to live happily, and enjoy a perfect immunity from many of the punishments to which they are doomed by the *less humane*, yet *more civilised* Europeans. The reason for this exemption arose out of a singular superstition. An emperor, who reigned at the close of the last century, chanced to be born under the sign of the *Dog*, one of the twelve celestial signs of Japan; and on this account the emperor decreed that all dogs should be deemed sacred. They, accordingly, have no masters, but lie and prowl about the streets as they list, to the extreme annoyance of many of the passers-by, and especially to those who are not possessed of very strong, affectionate, canine tendencies. If a pack of these dogs take it into their sagacious heads to attack a person, he must, on no account, beat or kill them, but suffer himself to be bitten, or, perhaps, like Actaeon, devoured. To kill one of them is death by the law, no matter what may have been the ferocity of the brute. In every town there are guardians of these dogs, and they alone are empowered to punish their charges. Every street must maintain a certain number of these animals, or, at least, provide them with victuals. Huts, or dog hospitals, are erected in different parts of the towns; and to these, in cases of sickness, the patients must be carefully conveyed by the inhabitants. The dogs that die must be carried up to the tops of the hills and the mountains, the usual places of burial for the human species, and there be respectfully interred. Had the speaking dog of Germany chanced to have been born in such a community, it is impossible to say what honours might have been conferred upon him. An emperor raised his horse to the dignity of the Roman magistracy; the Emperor of Japan might, at least, have made the dog a professor of languages.

The dog is not the only animal that can be trained to *point*. We have heard of other species matchless even in this particular. Mr. Daniel, in his *Rural Sports*, records the case of a female pig, the property of Mr. Toomer, gamekeeper to Sir Henry Mildmay, that was as perfect a *pointer* as ever took the field. Mr. Blaine substantiates the account of Mr. Daniel, by the evidence of an eye-witness of the facts recorded. "It was certainly," he says, "a mere matter of accident that occasioned the development of the peculiar scenting powers of this extraordinary animal. The aptitude of swine, generally, in finding certain palatable roots under ground was well known to Toomer; nor was it unlikely, by what followed, that he might have entertained an opinion, that almost any keen-scenting animal could be taught both to wind game, and to stand on the point towards it; and that he was, therefore, led to allow a female pig to accompany his young

pointers, in their breaking lessons, to the field. Be that as it may, it turned out, to the surprise and gratification of the intelligent keeper, that within a fortnight from her first *entrée*, she would hunt and point partridges or rabbits; and her training being much forwarded by the abundance of both, which were near the keeper's lodge, she daily improved, and, in a few weeks, would retrieve birds that had run as well as the best pointer; nay, her nose was superior to any pointer they ever possessed, and no two men in England had better. They hunted her principally on the moors and heaths. Slut has stood partridges, black-game, pheasants, snipes, and rabbits in the same way, but was never known to point a hare. She was seldom taken by choice more than a mile or two from the lodge, but as frequently joined them when out with their pointers, and continued with them several hours. She has sometimes stood a jack-snipe, when all the pointers have passed by it. She would back the dogs when they pointed, but the dogs refused to back her until spoken to—Toomer's dogs being all trained to make a general halt when the word was given, whether any dog pointed or not; so that she has been frequently standing in the midst of a field of pointers. In consequence of the dogs being not much inclined to hunt when she was with them—for they dropped their sterns and showed symptoms of jealousy—she did not very often accompany them, except for the novelty; or when she accidentally joined them in the forest. Her pace was mostly a trot; she was seldom known to gallop, except when called to go out shooting; she would then come home off the forest at full stretch—for she was never shut up, except to prevent her being out of the sound of the call or whistle when a party of gentlemen had appointed to see her out the next day, and which call she obeyed as readily as a dog—and be as much elated as a dog upon being shown the gun. She always expressed great pleasure when game, either dead or alive, was placed before her. She has frequently stood a single partridge at forty yards' distance—her nose in a direct line to the bird. After standing some considerable time, she would drop like a setter, still keeping her nose in an exact line, and would continue in that position until the game moved; if it took wing, she would come up to the place, and put her nose down two or three times; but if a bird ran off, she would get up and go to the place, and draw slowly after it; and when the bird stopped she would stand it as before: nor was her love of hunting confined to partridges only; but she has stood black-game, pheasants, snipes, and rabbits, and has been seen to do it to all these varieties in one day."

This, in some respects, may beat the powers even of the educated dog; but it is a rare, and, it must be acknowledged, an extraordinary instance of development in the porcine race.

THE SPANISH POINTER.

This dog is apparently one of very ancient extraction; but Mr. Richardson thinks he is not of Spanish origin—at least not remotely so; for the primitive breed is traceable to the East. The old Spanish pointer is, when perfectly thorough-bred, remarkable from having a *cleft nose*, similar to the Russian variety. The animal is altogether too heavy for the ardour of British sportsmen; and, with the old Talbot, or Manchester hound, has gradually passed out of notice. He has been displaced from the estimation in which he was held, by a lighter, more active, and energetic dog, more suitable to the tastes of the British sportsman; viz., the English pointer.

THE RUSSIAN POINTER.

This dog is covered with coarse, wiry hair, like the Russian terrier. He is somewhat less in stature than the ordinary pointer, and is lower in the shoulder. His nose *cleft*—hence he is frequently called the "double-nosed pointer." He is very staunch, and is held in deservedly high estimation. His temper, however, is said to be unbending, and he, therefore, requires the most careful training. When thoroughly broken in, and rendered perfectly subservient to the will of his master, he is esteemed a valuable dog, and brings a high price.

THE PORTUGUESE POINTER.

This animal is not so heavy as the Spanish pointer; and is not to be depended on, from his irritable disposition. He is very unsteady, and is favoured with a spreading tail. We introduce him here simply on account of his

bad qualities, that no person may have anything to do with him.

THE FRENCH POINTER

Wants the staunchness of our English dog. He is less objectionable than the variety just described, but still *not the thing*.

This dog has more to commend him than the Italian, but he has not the steadiness of the English breed. We do not know why this should be; but it strikes us that these canine creatures of the Portuguese and French people participate in some degree of the idiosyncrasies of the natures to which they themselves belong.

THE ITALIAN POINTER.

This is a perfect miniature variety of a very highly-bred English pointer, seldom exceeding one foot in height. Mr. Richardson says, he saw one, about twelve years ago, in possession of Stewart Monteith, Esq., of Closeburn, Dumfriesshire; and another, about the same time, in possession of Mr. Mather, an artist, resident in Edinburgh. These little dogs had exquisite noses, and would set game as staunchly as any other pointer, but were, of course, too small for field use

THE DALMATIAN, OR CARRIAGE DOG.

This animal greatly resembles the pointer; but is not remarkable for either its sagacity or power of scent. Notwithstanding these defects, he has been broken to the gun, and proved himself quite capable of holding his ground with other pointers. As he is not regularly trained to the field, whatever drawbacks he may have in hunting, may have sprung from that circumstance.

The sagacity of dogs of every variety of breed is universally acknowledged, and there are, every day, instances of its exemplification being witnessed throughout the civilised world. One of the most extraordinary displays of the possession of this quality transpired not long ago. Messrs. ——, tobacconists, closed their shop one evening, leaving their favourite Newfoundland inside. On opening the store on the following morning, the floor in the back room was found to be on fire, and the dog was labouring with his fore feet and mouth, trying to subdue it. A pail of water, which stood in the room, had been poured down the hole. The faithful animal had so successfully combated the fire as to prevent its spreading beyond a spot two or three feet square. How long the noble fellow had stood sentinel and fought down the advancing flames can only be conjectured; it must have been several hours. His feet, legs, and mouth were badly burned, and he was seriously injured internally by inhaling the hot air. He refused his food, and was apparently in much pain. He is worth his weight in gold, and may safely be pronounced the noblest of his race.

SPANIELS.

The *Spaniel* is a very ancient dog, the breed of which has, in various countries, received the utmost attention. In the Levant there seems to be several breeds; and even history has given the spaniel celebrity for its fidelity, and the affectionate disposition of which it is possessed. The chief order of Denmark, now called the Order of the Elephant, was instituted to commemorate the faithfulness of a spaniel, which adhered to the sovereign when his subjects deserted him. The motto to this order still exists, and it is simple, brief, and expressive—"Wildbrat was faithful." Mr. Daniel, in his *Rural Sports*, speaks of the amiability of a spaniel that belonged to the gamekeeper of the Rev. Mr. Corsellis. "The gamekeeper of Mr. Corsellis," he says, "had reared a spaniel, which was his constant attendant, both by day and night; wherever old Daniel, the keeper, appeared, Dash was close beside him; and the dog was of infinite use in his nocturnal excursions. The game, at that season, he never regarded, although, in the day-time, no spaniel would find it in better style, or in greater quantity; but at night, if a strange foot had entered any of the coverts, Dash, by a significant whine, informed his master that the enemy was abroad; and many poachers have been detected and caught from this singular intelligence. After many years' friendly connection, old Daniel was seized with a disease which terminated in consumption and his death. Whilst the slow, but fatal progress of his disorder allowed him to crawl about, Dash, as usual, followed his footsteps; and when nature was still further exhausted, and he

took to his bed, at the foot of it unwearily attended the faithful animal; and when he died, the dog would not quit the body, but lay upon the bed by its side. It was with difficulty he was tempted to eat any food; and although, after the burial, he was taken to the hall, and caressed with all the tenderness which so fond an attachment naturally called forth, he took every opportunity to steal back to the room in the cottage where his old master breathed his last. Here he would remain for hours; from thence he daily visited his grave; and, at the end of fourteen days, notwithstanding every kindness and attention shown him, he died literally broken-hearted." To this anecdote we may append the Danish motto, only altering the name, and say, "Dash was faithful."

"As the shepherd's dog," says Mr. Richardson, "is the faithful friend of those in the humbler walks of life, so are the spaniels to 'chiefs and ladies bright'—to the gentler sex, *par excellence*, and to those high in 'honour and in place.' Examples of the good qualities of these dogs are everywhere notorious. As the shepherd's dog represents the *utile*, so may these represent the *dulce*. The former, the rough and honest comrade of the rough and honest peasant—the latter, the associate of luxurious courtiers and of powerful princes; but still, though moving amidst tinsel and falsehood, never losing the primitive honesty and purity of intention which characterise his disposition."

The following we take from a communication made to a respectable paper:—"I had a spaniel dog that was particularly attached to me. She seemed quite conscious when I was about to leave home for a lengthened absence, and would whine and look exceedingly miserable on such occasions; though she would suffer me to depart without any exhibition of especial regret when I was only going to the neighbouring towns for a day or two. I was informed, on credible authority, that when I was in London, or any other distant place, and wrote home, this dog would select my letter from a number of others, and, if she could possibly obtain it, would run away with it in her mouth to some secure hiding-place, and cry over it; and, perhaps, if she had found words, would have exclaimed, like Hero, when perusing an epistle from Leander:—

"'With what delight I read your letter o'er;
Your presence only could have given me more.'"

How far credulity may be given to this instance of sagacity, we must leave it to the reader's own judgment to decide.

THE SETTER, OR LAND SPANIEL.

This spaniel was first broken in to *set* partridges and other feathered game, as an assistant to the *net*, by Dudley, Duke of Northumberland, in 1535; and Mr. Daniel, in his *Rural Sports*, gives a copy of a document, dated 1685, in which a yeoman binds himself, for ten shillings, to teach a spaniel to *set* partridges and pheasants. That the setter and the old original land spaniel are identical, there can be no doubt.

"There are several varieties of setter. The ordinary old English setter, with rather a square head and heavy chops, looking as if he had a dash of Spanish pointer in him: colour usually liver-and-white. The Irish setter, narrower in the head, finer in the muzzle; usually of a yellowish-red colour, perhaps the fastest of all setters. This is a dog in very high esteem; no trace of the pointer is seen in him. These are the genuine, unmixed descendants of the original land spaniel; and so highly valued are they, that a hundred guineas is by no means an unusual price for a single dog. There was a celebrated breed of these dogs—now, I believe, extinct—kept by that ancient and noble Irish family, the O'Connors of Offaly: those belonging to the late Maurice O'Connor were highly renowned, and the breed is described by his grandson as yet remaining."

Of the sagacity of every variety of spaniel, we have almost innumerable instances, which, to those who are unacquainted with the *mental* manifestations of dogs, sometimes appear so extraordinary, that it makes credulity pause before it can admit them into the repository of its facts. On one occasion, some gentlemen were shooting in the woods belonging to Mrs. Stackpoole and Miss Wasey, of Prior's Court, when one of the party (Mr. J. Wernham Pocock, of Chievely) discovered that he had lost his watch and chain. He recollected having them safely in his pocket about an

hour before, but had since been through a considerable portion of high cover. Fortunately, however, Mr. Pocock had a retriever dog with him, which he sent into the wood to find the missing valuables; hardly, however, supposing that he would really do so; but, upon following the animal some distance into the high wood, the dog was found to have taken his station at the stem of a small tree, into which he was anxiously looking up, and endeavouring to jump. Mr. Pocock's gratification and surprise may be imagined, when he saw his watch and chain suspended in the tree by the bough which had drawn them from his pocket.

The nature of the setter was generally well understood two centuries and a-half ago. Gervase Markham, in his work *On the Art of Fowling*, says—"I know that in divers places in this kingdom the *setting* dogs are to be taught (so that men of ability may have them at their pleasure); yet, likewise, I know they are sold at such great rates and prices, that no industrious man whatsoever (which either loves the sport, or would be partaker of the benefit) but will be glad to learn how to make a dog himself, and so both save his purse and make his pleasure and profit both more sure and more delicate; for this I must assure all men that buy their dogs from mercenary teachers, that evermore those salesmen do reserve in their own bosoms some one secret or another, for the want of knowledge whereof the purchaser quickly finds his dog imperfect, and so is forced upon every disorder or alteration of keeping to send the dog back to his first master anew to be reformed, which, drawing on you a new price, makes the dog's certain price without end, and without valuation. This fault to redress, and to make every man the true master of his own work, I will show you here, in a brief and compendious manner, all the mysteries and secrets which lie hid in this laborious business. The first thing, therefore, you must learn in this art, is to make a true selection of your dog which you intend to apply to this purpose of setting; and, in this selection, you shall observe, that although any dog which is perfect, and of good scent, and naturally addicted to the hunting of feathers—as whether it be the land spaniel, water spaniel, or else the mongrels between either or both of these kinds, or the mongrels of either of these kinds, either with the shallow-flewed hound, the tumbler, the lurcher, or indeed the small bastard mastiff—may be brought to this perfection in setting (as I have seen by daily experience, both in this and in other nations); yet is there none so excellent, indeed, as the true-bred land spaniel, being of a nimble and good size, rather small than gross, and of courageous and fiery metal, evermore loving and desiring toil, when toil seems most irksome and weary, which, although you cannot know in a whelp so young, as it is intended he must be when you first begin to train him to this purpose, yet you may have a strong speculation therein if you choose him from a right litter or breed, wherein, by succession, you have known that the whole generation have been endowed with all these qualities, as, namely, that he is a strong, lusty, and nimble ranger, both of active foot, wanton tail, and busy nostril; that his toil is without weariness, his search without changeableness, and yet that no delight nor desire transport him beyond fear or obedience; for it is the perfectest character of the most perfect spaniel ever to be fearful and loving to him that is his master and keeper. I confess I have seen excellent rare setting dogs made in the Low Countries, which have been of a bastard tumbler's kind; and, indeed, I have found in them (if I may so term it) a greater wisdom (which, indeed, is but a greater fear) than in our land spaniels; but, comparing the whole work together, that is, the labour of ranging, the scent in finding, and the act of setting, they have been much inferior to our dogs, and not able to make their ways in the sharp thickets and troublesome covers, nor stand up with them in the large and spacious campaigns. To speak then, in a word, touching the best choice of this setting dog, let him be as near as you can the best bred spaniel that you can procure; and though some have been curious in observing their colours, as giving pre-eminence to the motley, the liver-head, or the white or black spotted; yet, questionless, it is but a vain curiosity, for no colour is amiss for this purpose, provided the natural qualities be perfect, and answerable for the work to which end you intend them."

Notwithstanding all the precautions taken

in training the setter, there are some of them, when taken into the field, affected with what is called "gun-shy." A gentleman, whilst shooting with a friend, on the Clune Moors, in Morayshire, observed that one very handsome setter was invariably left behind; and, upon asking the reason, was informed that he was "gun-shy," and "ran home;" but that "*without the gun*, no dog could beat him on the hills." He was too good-looking to be thrown away, though his owner had but slight hope, after running home, that any good could be done. However, he tried, and the plan adopted was the following:—He coupled him to a retriever (a stronger dog than the setter), and took them on the hill; at first, the "gun-shy" setter wanted to bolt, but the retriever was too fond of the sport to allow it, when a sort of "pull devil, pull tailor" performance commenced, always ending in favour of the retriever. This went on for three successive days, each day the gun-shyness wearing off; and, on the fourth morning, no symptoms of it were visible. This dog was shot over for several months, and came at last to be pronounced by far the best dog in his kennel, which is by no means the worst in the North. Let a dog *see* what you are firing at, and not blaze over him in a kennel or yard.

Another sportsman, who had much experience of gun-shy in setters, found the only successful means of curing them was, by taking them out with some hunting terrier or dog, where game was abundant (whether winged game, or quadrupeds, was immaterial), and allowing them to run riot as they pleased for several days; then, while at a distance, and the dogs alone, to fire an occasional shot, never allowing them to see a whip, or even speak angrily to them, until their ardour became excessive. Then, for a dog, he would shoot a hare or rabbit, and give him the entrails; and should this have proved unsuccessful in removing his terror, he would break him off the way, by tying up one of his fore legs with a pair of couples, close under his neck, and then take up amongst the guns, and check him with a check-line (a long line annexed to a collar put round his neck, by which he may be held to a set), at which time the gun would be continually used, and no harsh severity whatever.

A sportsman, writing to *The Field*, says—"I have now a setter bitch—the best, I may say, I ever saw out—which was, at one time, under the influence of this fever (gun-shy). I had almost despaired of removing this alarm, when it occurred to me, as I wished to propagate the stock of an old dog setter, I would try what 'warding' would do. The effect was wonderful. On the 1st of September, I think it was, my keeper took her out after her love affair, and shot two-and-a-half brace of birds over her; she never bolted, nor has she evinced any feeling or symptom of fear at a gun, or the report of one; and is now, and has been since that time, one of the best dogs I ever shot to. I should recommend this plan of putting the dog to a bitch. If this does not succeed, he cannot do better than follow a work on dogs, written by Colonel Hutchinson, which work, I observe, other correspondents have recommended. Patience and kindness must cure the evil; squibbing off, occasionally, (leaving the dog) may accustom him to the report of a gun—increasing the load by degrees, and patting the dog, and giving him a piece of biscuit, cake, &c., after each discharge. Taking him out, also, with an old dog may do wonders, as a dog will more readily learn of his own species than from any other means. I have known the above remedy of 'warding' succeed in many instances."

Setters have been known to be affected with gun-shy up to eighteen months old, and after that turned out very well. These have not been actually gun-shy, but would not work off. If the dog runs away when the gun is fired off, some think they never get over it.

Mr. Richardson says—"The setter is by some sportsmen preferred to the pointer; and where water is to be got at occasionally, during a day's shooting, there can be no doubt of his superiority. He cannot, however, work without a drink as long as the pointer can, although, if he can obtain a sufficient supply, he can work still longer than that dog. In disposition, the setter is more affectionate, and more attached to his master individually, than the pointer is. He requires more training than the latter dog; but that training must be of a very mild and gentle description, lest the dog be *blinked*, or spirit-broken. The setter will always work best in cold and wet weather.

The pointer cannot, from his short hair, which makes him very susceptible of cold; but will stand out a day's shooting much better than the setter in very warm weather. However, the setter is decidedly the best dog for general use."

The black setter is a rare specimen, and is both staunch to his work, and beautiful. The Scotch setter stands high on his legs, but is difficult to break, from the quarrelsomeness of his disposition. He is usually of a black and tan colour.

Of the affectionate disposition of the setter, we have numerous illustrative anecdotes. Mr. Sherras Bell, F.R.S., F.L.S., in his *History of British Quadrupeds*, thus discourses upon the qualities of one of this kind of dog:—"By far the most interesting and, if I may so employ the term, amicable animal I have ever known, was a bitch of this kind, formerly belonging to my father, which he had from a puppy, and which, although never regularly broke, was the best dog in the field he ever possessed. The very expression of poor Juno's countenance was full of sensibility and affection. She appeared to be always on the watch to evince her love and gratitude to those who were kind to her; and the instinct of attachment was, in her, so powerful, that it showed itself in her conduct to other animals, as well as to her human friends. A kitten, which had lately been taken from its mother, was sent to us, and, on Juno's approach, showed the usual horror of the cat towards dogs. But Juno seemed determined to conquer the antipathy; and, by the most winning and persevering kindness and forbearance—advancing or receding, as she found the waywardness of her new friend's temper required—she completely attached the kitten to her; and, as she had lately lost her puppies, and still had some milk left, I have often seen them lying together before the fire, the kitten sucking her kind fostermother, who was licking and caressing her as her offspring. She would also play with great gentleness with some rabbits of mine, and would entice them to familiarity by the kindness of her manner; and so fond was she of caressing the young of the dog species, that when a spaniel bitch of my father had puppies, of which all, excepting one, were destroyed, Juno would take every opportunity to steal the remaining one from its mother's nest, and carry it to her home, where she would lick and fondle it with the greatest tenderness. Poor Pussy, the mother, also a good-tempered creature, as soon as she had discovered the theft, hastened, of course, to bring back her little one, which was again to be stolen on the first favourable opportunity; until, at length, the two bitches killed the poor puppy between them, as they were endeavouring each to pull it from the other; all this with the most perfect mutual good understanding. Juno lived to a good old age, an unspoiled pet, after her master had shot to her fourteen seasons."

A curious question arising out of the game laws—Can a farmer be unlawfully on his own farm?—was argued some time ago in the High Court of Justiciary in Edinburgh. It was an advocation and suspension of a judgment of the sheriff-substitute of Dumfries, whereby Mr. Smith, tenant of the farm of Broadleydyke, Lochmaben, was sentenced to a month's imprisonment with hard labour, for being guilty of night poaching on his *own* farm, under 9 Geo. IV. c. 69. By this statute it is enacted, that if any person shall, by night, unlawfully take or destroy any game or rabbits in any land, whether open or enclosed, or shall, by night, unlawfully enter or be on any land, open or enclosed, with a gun, net, engine, or other instrument, for the purpose of taking or destroying game, such offender may be apprehended, &c. On the 12th of December, the complainer was served with a criminal libel, charging him with having been on his farm by night for the purpose of taking or destroying game, and guilty therefore of the above statutory offence. The case was tried before Sheriff Trotter, on the 20th of December; and his lordship having found him guilty of being upon the lands for the purpose of taking or destroying game, pronounced the sentence of which the present was a suspension. The grounds on which the conviction was sought to be quashed were—First, that the complaint was irrelevant, and ought to have been dismissed; because, while the statute drew a distinction between destroying game or rabbits, and being unlawfully on the lands by night for the purpose, the major of the libel embraced them both as one offence—

a circumstance which was fatal to the indictment in the case of Mr. Cornet (1825); further, the *species facti* did not amount to either of the crimes specified in the statute. In the second place, the act did not apply at all to the complainer's case, because it was *his own farm*, and he could never be unlawfully there under any circumstances. In the third place, it was maintained that the terms of the conviction were bad, and inapplicable to the statute, inasmuch as the qualifications, "with any gun, net, or other instrument," were omitted. The judges were unanimous in holding that, from the terms of the conviction, it must be set aside; but they were divided in opinion as to whether a farmer could be *unlawfully on his own farm* in the sense of the act. Lords Deas and Cowan were of opinion that he could not. Lords Handyside and Ardmillan that he could. The Lord Justice Clerk gave his casting vote in favour of the latter view, and the sentence was suspended with expenses.

Thus it would seem doubtful whether a man has a right to be on his *own* farm with a gun in his hand.

THE WATER SPANIEL.

This is a sturdy dog, with crisped hair, and of variable stature, according to the sporting duties he has to be engaged in. Those of this species that have to be employed on the banks of rivers, moors, or lakes, should be small, but strong and spirited. Old Gervase Markham says—"The water-dog is a creature of such general use, and so frequently in use here in England, that it is needless to make any large description of him; the rather, since not any amongst us is so simple that he cannot say where he sees him. This is a water-dog, or a dog bred for the water; yet, because in this (as in other creatures) there are other characters and forms which pretend more excellency, and figure a greater height of virtue than others do, I will here describe, as near as I can, the best proportions of a perfect water-dog. First, for the colour of the best water-dog, albeit some (which are curious in all things) will ascribe more excellence to one colour than to another, as the black to be the best and hardiest, the liver-hued swiftest in swimming, and the pied or spotted dog, quickest at scent; yet, in truth, it is not so, for all colours are alike, and so dogs of any of the former colours may be excellent good dogs, and may be excellent good curs, according to their first hardening and training; for instruction is the liquor wherewith they are seasoned, and if they be well handled at first they will never smell of that discretion; and if they be ill handled they will ever stink of that folly; for nature is a true mistress, and bestows her gifts freely, and it is only nature which abuseth them." He next proceeds to the clipping or shearing of this animal. "Now, for the cutting or shearing him," he continues, "from the navel downward or backward; it is two ways well to be allowed of, that is, for summer hunting, or for wager; because these water-dogs naturally are ever most laden with hair on the hinder parts, nature, as it were, labouring to defend that part most which is continually to be employed in the most extremity; and because the hinder parts are ever deeper in the water than the fore parts, therefore nature hath given them armour of hair to defend the wet and coldness; yet this defence in the summer time, by the violence of the heat of the sun, and the greatness of the dog's labour, is very noisome and troublesome, and not only maketh him sooner to faint and give over his sport, but also makes him, by his overheating, more subject to take the mange. And so, likewise, in matter of wager, it is a very heavy burthen to the dog, and makes him to swim less nimbly and slow, besides the former offences before rectified; but for the cutting or shaving of a dog, all quite over even from the foot to the nostril, that I utterly dislike; for it not only takes from him the general benefits which nature hath lent him, but also brings such a tenderness and chilliness over all his body, that the water in the end will grow irksome under him."

We have modernised the spelling of the above, in order that the quaintness of Markham may the more generally be appreciated, and his sense the more easily comprehended.

Markham's instructions, relative to training the water-dog, are excellent, and more or less applicable to all dogs.

"Now for the manner of training or bringing up of his water-dog: it is to be understood that you cannot begin too early with him; that is to say, even when you first wean him, and teach him to lap, for even then you shall begin

to teach him to couch and lie close, not daring to stir or move from that posture in which you put him without your especial license, cherishing him ever when he doth your will, and correcting him when he doth the contrary; and always observing this maxim in the first teaching of him, that you never let your dog eat or taste any meat, but when he doth something to deserve it, that custom may make it. Known food is a thing which cometh not by chance, or the bounty of your hand, but for reward or merit when he doth your commandments; and this will not only make him willing to learn, but kept to remember and retain what he learneth, and diligently to perform your pleasure without stick or amazement; the characters of your commands being so deeply imprinted in his knowledge; and to this end, you must have no more teachers, no more feeders, cherishers, or correctors, but one—for multiplicity breeds confusion—and to teach divers ways is to teach no way well; also you must be very constant to the words or directions by which you teach, choosing such as are the most significant for your purpose, and fittest for the action you would have the dog do, and by no means alter the word which you first use. When, therefore, you have made your whelp understand these several sounds or words, and that he will couch and lie down at your feet, how you please, when you please, and as long as you please, and that with a single word or a look only; you shall then proceed and teach him to lead in a line and collar, following you at your heels in decent and comely order, neither treading upon your heels, nor going before or side by you, which shows too much haste; nor hanging back, or straining your line, by the means of too much sloth, but following in decent and orderly manner, without offence either to the dog or his leader; and this kind of leading is to make the whelp familiar with you that he may love and acknowledge you, and no man else. When this general obedience is taught (which is done by observation of his going, and moving him by sights or sports, which may tempt him to stray beyond his bounds, and then to correct his offences, and to cherish and reward his obedience), you shall then teach him to fetch and carry anything you shall throw forth of your hand."

The water spaniel is greatly improved in point of beauty by intermixture with the land spaniel. The small-sized water spaniel is, by some, considered the best to hunt with, as they make excellent retrievers, and are exceedingly active and expert at their work. Some, however, prefer middle-sized dogs, perhaps from the conception that they are a little stronger; but what they have in strength, the probability is that they lose in activity. It is from this supposition that some have even gone so far as to cross the spaniel with the Newfoundland; but, we believe, the preference, by many eminent sportsmen, is generally given to the smaller-sized animal. The water spaniel is the most faithful and affectionate of all dogs. In these qualities he may be said even to surpass, certainly to rival, Arrian's description of the hound, Hormé, which was "most gentle, and kindly affectionate." "Never before," says Arrian, "had any dog such regard for myself and friend, and fellow sportsman, Megillus; for, when not actually engaged in coursing, he is never away from one or the other of us; but while I am at home, he remains within by my side, accompanies me on going abroad, follows me to the gymnasium, and, while I am taking exercise, sits down by me. On my return, he runs before me, often looking back to see whether I had turned anywhere out of the road; and, as soon as he catches sight of me, showing symptoms of joy, and again trotting on before me. If I am going out on any government business, he remains with my friend, and does exactly the same towards him; he is the constant companion of whichever may be sick; and if he has not seen either of us for only a short time, he jumps up repeatedly by way of salutation, and barks, with joy, as a greeting to us. At meals, he pats us first with one foot, and then with the other, to put us in mind that he is to have his share of food. He has, also, many tones of speech, more than I ever knew in any other dog; pointing out, in his own language, whatever he wants. Having been beaten, when a puppy, with a whip, if any one, even to this day, does but mention a whip, he will come up to the speaker, cowering and begging, applying his mouth to the man's, as if to kiss him, and, jumping up, will hang on his neck, and not let him go until he has appeased his angry threats.

Now, really, I do not think that I should be ashamed to write even the name of this dog, that it may be left to posterity that Xenophon, the Athenian, had a greyhound, called Hormé, of the greatest speed and intelligence, and altogether supremely excellent."

Flattering as this description is, we cannot think it over-drawn, for we, ourselves, have been possessed of dogs of different breeds, which have testified the utmost affection, not only to ourselves personally, but to all the members of the household, except the servants, whom some of them have marked out for a smaller proportion of their favour. We have already alluded to the motto, "Wildbrat was faithful," as belonging to the principal order in Denmark; and there is another instance of faithfulness in the spaniel, also connected with history, and which places the sagacity of this beautiful species of dog in a most favourable point of view. The circumstance is noticed by Mr. Blaine, in whose language we will here give it; but the anecdote is given by Mr. Daniel:—

"Lodebrook, of the blood-royal of Denmark, and father to Humber and Hubba, being in a boat with his ox and his dog, was, by an unexpected storm, driven on the coast of Norfolk; where, being discovered, and suspected as a spy, he was brought to Edmund, at that time king of the East Angles. Making himself known, he was treated with great hospitality by the monarch, and particularly so on account of his dexterous skill in hawking and hunting. The king's falconer grew jealous of this attention, and, lest it should lessen his merit in his royal master's opinion, and so deprive him of his place, had the treachery to waylay Lodebrook, and murder him, and conceal the body amongst some bushes. He was presently missed at court, and the king manifested great impatience to know what was become of him, when his dog, who had staid in the woods by the corpse of his master, till famine forced him thence, came and fawned on the king, and enticed him to follow him. The body was found, and, by a chain of evidence, the murderer was discovered: as a just punishment, he was placed alone in Lodebrook's boat, and committed to the mercy of the sea, which bore him to the very shore the prince had quitted. The boat was recognised; and the assassin, to avoid the torture, falsely confessed that Lodebrook had been put to death by the order of Edmund, which account so exasperated the Danes, that, to revenge his murder, they invaded England."

The water spaniel is of considerable antiquity. He is sculptured on many Roman remains; and Colonel Smith thinks him identical with the *Canis Tuscus* lauded by Nemesian.

THE RETRIEVER.

This is a useful dog, but of uncertain parentage. He has been called an *indefinite* dog. He is required to act many parts—to make a tolerable pointer, a better setter, and a handy hunter, in thick covers after wounded game. To be perfect in his calling, he should, on the very glance of your eye, spring among tangled woods and briars, or rush into the water, pick up, and bring out a dead or wounded bird. He is necessarily an animal of great canine attainments, full of intelligence of the highest order; remarkably quick in his apprehension, adventurous, and swift of foot. This kind of dog is a necessary appendage to a regular shooting establishment. It is astonishing how sagacious he becomes by proper training, and how much his labours facilitate the acquisition of a good day's sport. The great error to guard against, is the haste and impatience which are embodied in his nature.

Speaking of the desire which every thorough sportsman has to have every species of dog adapted to the peculiar kind of game to be hunted, Mr. Blaine says that he knew such a one, who, when ranging his pointers in advance, was always followed by a retriever of very rare qualities. His pointers, also, did their duty to admiration; and when they came to a steady point, bang from each barrel followed, and two birds usually fell; the pointers remained on the spot, motionless witnesses. A move of the sportsman's hand, and the "away" to the retriever, sent him off like lightning, and he returned with both birds. The ability of this dog was such, that when two birds fell, he would hold one by the neck, and the other by the wing, near to the body; by which device neither bird would be injured, nor himself encumbered. In pheasant-shooting, likewise, the excellent discipline of this dog, and his extra-

ordinary tact, were the delight of all who saw his performances. Training is everything. It operates on the canine as it does on the human species. It gives them knowledge, understanding, and intelligence. In these expressions we hope to be considered as not exalting the dog to an equality with the man. We employ them because we know of none better to convey our meaning. To a certain extent, the dog is possessed of all the qualities they express. Who will gainsay that he has not knowledge, understanding, and intelligence?

"To see," says Mr. Apperley, speaking of the feeding of a kennel of hounds—"to see sixty couple of hounds, all as hungry as tigers, standing aloof in the yard (as is the practice in some kennels), and without even hearing, much less feeling the whip, not daring to move until the order is given them to do so! And what is the order given? Why, at the words, 'Come over, bitches,' or, 'Come over, dogs,' every hound of each individual sex comes forward, as the sex it belongs to may be called for, leaving those of the other sex in their places. Then the act of drawing them to the feeding-troughs is an exceedingly interesting sight. Often, with the door wide open, and the savoury meat in their view, the huntsman has no use for his whip, having nothing to do but to call each hound by his name, which, of course, he readily answers to. The expression of countenance, too, at this time, is well worthy of notice; and that of earnest solicitation, of entreaty, we might almost say of importunity, cannot be more forcibly displayed than in the face of a hungry hound awaiting his turn to be drawn. He appears absolutely to watch the lips of the huntsman, anticipating his own name." Here the qualities to which we have alluded are exemplified in a marked degree.

The retriever is sometimes a cross between a Newfoundland and a pointer; and, indeed, Newfoundland dogs, themselves, act as retrievers. The general tractability and docility of these dogs render them easily to be taught to do almost anything but speak. Some have shot woodcocks to them. In reference to retrievers being trained by children, opinions differ. "Six years since a gentleman bought a retriever, that had been trained by children to fetch or bring stones from the bottom of a river, until his teeth had been broken with the practice, and he proved altogether worthless as a sporting dog. It is now upwards of six times six years since I committed the very same blunder, and my dog seems to have been even worse than his, for I never could get him to take the slightest notice either of gun or game; and so lively a recollection have I entertained of the circumstance ever since, that I never dreamed afterwards of buying a dog until I had tried him at the actual work for which I wanted him. His dog was trained by children; so was mine; and with my dog, at least, the children had done their part to admiration. The dog knew his lesson perfectly: the spike-collar could not have done it better, if it had been applied at twelve months old, to make him dive for stones, and fetch them up from the bottom of a river. The mistake, in both cases, was in keeping the dogs at child's play too long and too exclusively to admit of their being turned into sporting dogs afterwards; or, rather, I should not have bought a dog for a retriever that had done nothing but fetch stones for children until his teeth were broken.

"I have now in my house a little animal, a cross between a Blenheim spaniel and a foreign nondescript. He belongs to my children, and they have taught him tricks enough to qualify him for an exhibition; his teeth are all gone with gnawing sticks and fetching stones, and he is as fond of these things now as he was six years ago as a puppy; but, notwithstanding all this, a better little dog never hunted a rabbit out of a furze-brake, or a water-hen out of a bed of rushes; and, whether he is standing in a corner, or performing any other of his numerous antics, the click of my gun-lock will send him screaming to the house-door."

Training is everything, we repeat; although a spaniel or retriever should range close on flat ground, he ought always to enter and remain in cover, however far from it a shooter may think proper to station himself. Nothing can be more annoying than an animal scampering on dry leaves in and out of a wood, effectually preventing our hearing a cock rise, and all kinds of game from approaching us. Neither should he be allowed to quit a wood to hunt the banks of a brook for water-hens. A pointer that has

been used as a snipe dog the preceding winter, will bring a man down from the top of a grouse-hill, in August, to the well-known bog, for a worthless snipe; and a spaniel will make for anything in the shape of water, to potter on the stale scent of water-hens, and soon acquire the vile habit of hunting straightforward, without tack or traverse.

"While making my annual collection of brown feathers, during the late frost," says a follower of the angle, "I was reminded, more than once, of the device which has often enabled me, when fonder of wild-fowl than at present, to recover a mallard lying on the edge of dangerous ice, without risking the loss of a valuable retriever. Ten-to-one other men have had recourse to the same *ficelle;* but, as it may be new to some, I will mention it. Having nearly lost a valuable retriever, and risking my own life to save his, I bethought myself of an old salmon-rod, to which I attached a sufficiency of whipcord, with four large hooks tied, back to back, at the end of it. The rod was an old stiff travelling jack-of-all-trades, in five pieces, portable, and fit for service at once. My attendant carried this, of course, and, when required, mounted it while I was loading. Very little practice enabled me to hook a duck within five-and-twenty yards. When feathers were scarce, and I was particularly anxious to secure a drake, if beyond the reach of my line, I attached a cord to the retriever's collar before sending him into dangerous ice.

"When ascending a river I kept about half a gun-shot from the bank, my man following rather more than a gun-shot in the rear, and close to the river. When ducks had been marked down, I approached at right angles to the direction of the stream, making allowances for the birds swimming up, which they generally do after alighting.

"I think I have observed, that when a duck rises wild, and, after making several circles in the air, settles near the place from which he rose, there is reason to expect others near him—very often a single bird of the other sex. In this case, both birds will occasionally be very close, if no noise be made when the single bird rose. At all events, a duck that drops in a hedge, or other thick cover, at some distance from a pond or river, will generally let you get near enough to be picked up, or recovered by the retriever."

The value of a retriever is sometimes very considerable. "At the Kingston assizes, an action (Clegg *v.* Hobbler) was tried to recover the value of a dog shot by defendant. The dog was a retriever puppy, three months old, and very well bred. He stayed away from home, and nothing was heard of him for several days, when he was brought home dead. The dog had gone into a field belonging to the defendant, where there were some sheep; and, while he was chasing them about, defendant came with a gun, and at once shot him dead.—Baron Alderson inquired of the plaintiff what kind of retriever the dog was.—The plaintiff replied, that he really was unable to tell how he was bred. All he knew was, that he was a retriever, and that his father was a very valuable animal.—Baron Alderson said, that all sorts of dogs might be trained as retrievers; and he had even heard of a pig being a retriever.—Mr. James: Yes, my lord, for truffles!—The learned judge said he should like to hear something more respecting the breed of the dog.—Mr. James: My lord, the father of the dog is here, and he shall be produced presently.—Witnesses were examined to prove that the dog was shot by the defendant, and the deceased's father was then placed on the counsel's table. He was a fine handsome animal, and it was stated that his sporting qualities were first-rate. He appeared very much dissatisfied with his novel position among so many wigs.—Mr. Brooks, on behalf of the defendant, said, that at the time in question, the sheep that were in the field were fat, and ready for the butcher. They had been worried by a dog two or three nights before; and, on this night, he supposed it was the same dog; and, on his going into the field, he found him chasing the sheep about, and shot him.—Baron Alderson said, that *he had acted illegally. Even if the dog had worried the sheep, a person was not justified in destroying him until he had tried to get him away by fair means.* Ultimately, on the learned judge's suggestion, it was decided that defendant should pay all plaintiff's costs out of pocket, and a certain sum as the nominal value of the dog."

Thus, it is illegal to shoot a dog upon your own property, even although he is in the act of chasing and frightening your sheep, until you have tried to make him desist, or to drive him from the field by fair means.

GENERAL REMARKS ON SHOOTING DOGS.

After the sportsman has secured his sporting quarters, the next consideration is his dogs. What kind shall he take? If he has them, good and well; if not, the sooner he procures them, and gets to know them, the better. Dogs are not put into condition for work in a week, nor yet in a month; and a man really fond of sport, will, himself, take the greatest interest in the exercising of his dogs, so as to prepare them both in wind and in foot for this, the hardest of all work for them; and if men would themselves take their dogs out for their daily walks along the road, they would feel the benefit of it in August, by their own feet being in better order for walking, and by their dogs knowing them well, and beating for their master, instead of for the keeper. Colonel Hawker tells us to use "well-tried and staunch dogs;" and others say, that "dogs for grouse-shooting ought to be first-rate in every respect—the highest bred, and best disciplined;" though the colonel prefers setters, and advises, when practicable, a mixture of pointers and setters. In Daniel's *Rural Sports*, in Lascelles' *Familiar Letters on Sporting*—in fact, in every book on the subject, but in none more succinctly and better treated than in Blaine, we find the same thing—"To have good sport, you must have good dogs." What can be more disappointing, or annoying, than to find, on arriving at the moor, that when you want to be killing game, you have to be dog-breaking?—that the dogs either won't range at all, or else run up more birds than they point—and that when you do get a shot, you have to shout until you are hoarse to make them "down charge," putting up two or three birds under your feet; and, having loaded, put yourself into a fever of perspiration with thrashing them for "running in," and snapping the bird you have killed, spoiling your grouse, your temper, and your shooting for the rest of the day. This may seem an unusual case; but any one who shoots chiefly on subscription moors, will bear us out, that more than half the men one meets with, are provided with a team of dogs not one iota better than we have described. Where, then, is a man to procure good dogs? is the natural question. Let him go to a really respectable breaker, or keeper; have a good trial, and give a good price. Some parts of the year are certainly not favourable to see dogs well tried, especially when birds are sitting, and have very little scent; and if it is necessary to see whether a dog is "free from hare," it is difficult to find one without going into corn or mowing grass. The dog's general style, working to hand and obedience, however, can be judged of, as also his condition, and the hardness of his feet; and if he has been shot over for one or more seasons, so much the better. But, to any one who wishes to shoot in comfort, we would say, avoid what is called "a promising young dog, just out of the breaker's hands, and ready for work," unless you can have a really good trial, and see powder burnt over him. No one ought to take less than two brace of dogs to the moors, so as to be able to change them at noon, and keeping the best for the afternoon shooting. It is true good setters will go all day, and some every day in the week; and though we believe some pointers are capable of almost the same exertion, we have never met with them; still, it is hard upon the animal, however courageous, to tax his strength beyond certain limits, and is, besides, a comfort to oneself to let out a fresh brace after luncheon. By the way, some men have their spare dogs led along with them, which is a great mistake, as, with the excitement of watching their master shoot, and the pulling against the man who leads them, they are never resting. We knew one who liked his dogs to begin the season, though not over fat, with plenty of flesh on their ribs. He thought they worked better for it, and very soon got to their hard-condition trim, and doing their work better than dogs that are kept thin by poor diet; for if dogs are properly fed before going to the moors, no one can have them in spare working condition with common road exercise, unless he give them fifteen or twenty miles a day after a horse, like greyhounds. He fed his dogs pretty much the same all the year round, with the exception of substituting "greaves" for flesh in hot

weather; good boiled oatmeal, flesh (or greaves), with potatoes boiled in the soup, and occasionally cabbage sliced into it, and plenty of salt, which he thought the best food for dogs at all times. When at the moors, and one has not the same convenience for cooking, he used barley-flour instead of oatmeal (as it only requires scalding), with "greaves" and salt, and milk, if he could get it.

The miserable accommodation for dogs that one generally meets with on subscription moors is well known, and mostly consists of some wretched barn or outhouse, with the roof half off, no door, and the floor as wet as a snipe-ground. In this case, the comfort of having your own servant will, in itself, repay the expense of taking him down with you, instead of trusting to some man whom you may hire as bag-carrier, &c., at four or five shillings a day, and who, having no interest in your dogs, neither feeds nor takes care of them as he ought. Your own man will, with a few boards, &c., make the best of the place in which they have to live. He will also prepare their food properly before you go out in the morning, so that they may be fed immediately on your return, instead of being left for an hour or so, during which they have curled themselves up to sleep, and are too stiff and tired to leave their benches to eat. He will also let them out for a few minutes the first thing in the morning, whilst he is cleaning out their kennel; putting in a little fresh straw, if required, and filling their troughs with fresh water, &c. All dogs' feet should be dipped in strong salt and water immediately on coming off the moors; and a couple of minutes with the "dandy-brush" will, if they come in wet, cause them to dry in half the time that they otherwise would. Dogs, in hunting, are sometimes bitten by vipers. These reptiles, the only venomous of the three British varieties of the snake, abound on some moors; and, unless the bite is promptly treated, a valuable dog's life may be lost. Sweet oil, the fat of vipers, train oil and tar, and numerous other remedies, are advised; but the common "burdock" is an excellent specific. This was told us by an old poacher; and, though we constantly used to lose dogs, sheep, and even cows, notwithstanding all our care, before we knew of this remedy, we never lost another animal afterwards. The mode of using it is to slice or scrape a large handful of the root, and pour upon it about two quarts of boiling water; when this infusion is cool, foment the bitten part with it many times a day, and pour about half a wine-glass of it down the dog's throat three or four times a day. We never knew this to fail, and the dog is fit for work in a couple of days. This subject, however, will be treated more at large when we come to speak of the diseases and accidents to which dogs are subject.

BREEDING, BREAKING, AND TRAINING SPANIELS, SETTERS, AND POINTERS.

There has been much written on this subject; and dog-breaking, at the present day, is pretty much the same as it was in the time of Gervase Markham. The art of breeding, however, has occupied the attention of many able sportsmen. In a state of nature, the sexual appetency of a bitch occurs only once a year; but, in a state of domestication, it occurs oftener, within six, eight, or nine months. This arises from the difference of food upon which the animal is fed, and the consequently changed condition of its habits and constitution. In breeding dogs, the *in-and-in* system has had both its advocates and its opponents. One interested in this subject says, that there have been various animals of the finest qualities bred from parents very nearly related to each other; and this is perfectly true: if we have a male and female full brother and sister, and both of very fine quality, the chances are that we shall have a fine progeny. "I had a very fine greyhound from this method; at the same time, one of the whelps was quite an idiot, and I was forced to destroy it when about two months old. My personal experience, with regard to the lower animals, is not very extensive; but, being naturally fond of the study of natural history, I have taken every opportunity of gaining information; and I find among farmers a constant habit of introducing a male from some other family. Gamekeepers pursue the same plan with regard to dogs; they call it introducing fresh blood: they generally adhere to the same kind, but not always: the best greyhounds have a cross with the bulldog; and, I believe, though I speak with diffidence,

that the best race-horses are all cross-bred—that is to say, they are the cross produce of various kinds, such as the Barb, the Arab, the English and Spanish horses,* the latter an undoubted cross-breed in itself, from horses introduced into Spain by the Moors; and, however good many of the pure or thorough-bred horses—such as Barbs and Arabs—may be, yet they are no match, as regards speed, with the cross-breeds of our own country. They may have more endurance in the country where they are bred, because, being bred there, they are more suited to the climate and nature of the ground; and this is the case with every thorough-bred animal whatsoever; if you alter the circumstances, you alter the animal to suit them. The Skye terrier in England, after two or three generations, is not the Skye terrier of the Isle of Skye; its habits and form alter greatly. I used often to speculate and wonder why it should have such short and powerful legs and long body; but one day, while watching some puppies of pure breed at play, I saw the mystery explained. There was a mound of earth, standing at an angle of about 70°, the surface of which being loosened by frost, rolled down at the slightest touch; the puppies, with their short strong legs and elongated bodies, climbed up this with little difficulty, and, having got to the top, turned round, and, thrusting their fore feet forward, slipped down on their bellies, kicking themselves along with their hind feet. This operation, which they repeated over and over again, seemed to afford them infinite gratification, and the surface of the hillock became grooved by their breasts being ploughed repeatedly down it. Here was a wonderful instance of the form of the animal being adapted to the locality. The Isle of Skye has a singularly rocky and uneven surface, and these short-legged and long-backed animals are admirably suited to it. These dogs have a very thick skin, clothed with a large quantity of long hair, both calculated to protect them against falls.

"It should be observed, that the system of breeding-in, in both wild and domestic animals, is not by any means a haphazard affair, as it certainly is with the human race. With domestic animals we always select the finest; and animals in a state of nature, make that selection for themselves, by the constant war carried on by the strong against the weak. In spite of all the care that can be taken, however, farmers find it absolutely necessary to introduce males from other families among their flocks and herds. This is a fact which I think cannot be disputed; it is one which is acknowledged and acted upon by every breeder of stock. Good horses, good cattle, sheep, and dogs, have undoubtedly been produced by close breeding; but it does not seem to last many generations."

Another says—"I think most breeders, either of cattle, horses, or dogs, will agree as regards the expediency of introducing fresh blood into their stock. I believe the produce of animals closely related is finer; but I presume that is from deterioration in strength and bodily power. When I write 'finer,' I mean smaller bone, and altogether more delicate. It is the custom amongst many cattle-breeders to change the stock bull every three years at least; and this plan is highly satisfactory. Perhaps it has already been remarked that, a mare having had a mule foal, and then afterwards a foal bred from a horse, there is a wonderful similarity in some point to the mule—that is, of a 'mulish' character, often in the head. I was much struck with an instance of this some time ago. Sows and bitches strain back in the same way."

Upon this subject Mr. Blaine has his opinion, which he has mixed up with the opinions of other breeders, in a passage somewhat lengthy, but, nevertheless, so valuable, that we cannot resist the temptation of extracting it. "Mr. Bakewell professed always to breed animals in general from near relationship, and how successful he was in his system is well known. Mr. Meynell also bred most of his celebrated hounds *in-and-in*. But on this matter Sir John Sebright, in his pamphlet on the *Art of Improving the Breeds of Domestic Animals*, observes—'On speaking to Mr. Bakewell on that subject, I found that he did not attach the same meaning that I do to the term *in-and-in*. He said that he frequently bred from the father and daughter, and the mother and son. This is not what I consider as breeding *in-and-in*; for the daughter is only half of the same blood as the father, and will probably

* This we have already shown in our division on the horse.

partake, in a great degree, of the properties of the mother.' 'I have tried,' says the sporting baronet, 'many experiments by breeding *in-and-in* upon dogs, fowls, and pigeons; the dogs became, from strong spaniels, weak and diminutive lap-dogs; the fowls became long in the legs, small in the body, and bad breeders.' Sir William Clayton, in his *Treatise on Greyhounds*, is also, in some degree, unfavourable to breeding akin. He says—'If continued for some litters, a manifest inferiority of size, and a deficiency of bone will soon be visible, as well as a want of courage and bottom, though the beauty of the form, with the exception of the size, may not be diminished.' Mr. Beckford is also averse to consanguineous breeding among dogs. 'A very famous sportsman,' he says, 'has told me, that he frequently breeds from brothers and sisters. As I should be very unwilling to urge anything in opposition to such authority, you had better try it; if it succeeds in hounds, it is more, I believe, than it usually does in other animals.' It is remarkable that the ancients, although they advocated the system of *in-and-in* breeding among all other domestic animals, yet were averse to it in the dog. In the *Geoponier*, 1, xix. c. i., we are cautioned against breeding between individuals of the same litter. Conrad Gesner, on this subject, observes, 'that the very best dogs are bred each in their own line, or from parents of a similar kind; but an extreme care in huntsmen for improvement, has led them so to mingle different breeds as to make the varieties almost innumerable.'"

"Like begets like," is a truism; and in no instance is it more just, nor in any more important than in dog-breeding; consequently, it is not easy to be too careful that the qualities and form of both parents be as perfect as possible. As no bitch is without some defect, so it should be remembered, in selecting a mate for her, that the dog should not only be entirely without that particular defect, but even superabundantly furnished contrariwise. If the strain borders on the light and leggy, do not perpetuate the defect, but choose a dog not coarse, but strong and well trussed. If the bitch incline to be *flew* (tender), fix on a dog for her that is singularly hardy. The qualities also must be attended to in breeding, for they run as much in the blood as the form does. If the bitch, though exquisite in figure, be yet wanting in metal, give her a mate with as much dash and determination of the right kind as possible. If, on the contrary, though well-nosed, she is given to skirting, to run riot, to babble, or to any other hurtful propensities, cross it with super-excellence, in the opposite quality in the dog selected for her. Skirting particularly by removing the breed, by letting the skirter be mated with a thorough *line hunting* hound. It is by judicious crossing that the pack is rendered complete. Let masters of hounds be very careful, likewise, in entrusting their favourite bitches to the care of the attendants of other kennels. There is infinite risk and chance of deception in this, because, where the stallion, be it fox-hound, greyhound, or pointer, is of great celebrity, the probability is, that such dog is already fully engaged, in which case another dog may be fraudulently substituted, and the bitch served by one that, instead of mending the breed, may increase its defects. On this subject Colonel Cook well observes—"It is the custom to send bitches to the fashionable stallions of the day; for instance, as formerly, to the late Mr. Meynell's 'Gusman;' Lord Fitzwilliam's 'Hardwick;' Lord Yarborough's 'Ranter;' Mr. Ward's 'Charon;' the Duke of Rutland's 'Topper;' the Duke of Beaufort's 'Justice;' the Duke of Grafton's 'Regent;' Lord Lonsdale's 'Ruler;' Mr. Smith's 'Champion;' Mr. Munster's 'Collier;' Lord Myddleton's 'Vaulter;' &c.: but, as it generally happens that your brood bitches go to heat much about the same time, it is therefore not very probable that one stallion hound can ward many bitches, besides those of the owner; nor is it reasonable to expect, in the height of the season, that the dog-hounds can be left at home to ward bitches from other kennels. I would suggest, in order to be more certain of your breed, that you send your bitch to a well-bred dog, brother, if possible, to the stallion hound; and, to prevent any mistake, order your servants to see the bitch warded."

We have remarked, in reference to the horse, that, as a general rule, "like produces like;" and we think the same will be found to hold good in reference to the dog. Mr. Beckford advises us to consider the size, shape,

colour, constitution, and natural disposition of the dog intended to be bred from, as well as the fineness of his nose, his stoutness, and mode of hunting. "On no account," he says, "breed from one that is not stout, that is not tender-nosed, or that is a skirter." Similar instructions to these are set forth by Somerville, in the following lines:—

"Observe with care his shape, sort, colour, size;
Nor will sagacious huntsmen less regard
His inward habits; the vain babbler shun,
Ever loquacious, ever in the wrong;
His foolish offspring shall offend thy ears
With false alarms, and loud impertinence.
Nor less the shifting cur avoid, that breaks
Illusive from the pack; to the next hedge
Devious he strays; there every means he tries;
If haply then he cross the steaming scent,
Away he flies vain-glorious, and exults
As if the pack supreme, and in his speed
And strength unrivall'd. Lo! cast far behind,
His vex'd associates pant, and lab'ring strain
To climb the steep ascent. Soon as they reach
Th' insulting boaster, his false courage fails;
Behind he lags, doom'd to the fatal noose,
His master's hate, and scorn of all the field;
What can from such be hop'd but a base brood
Of coward curs, a frantic, vagrant race."

In breaking dogs to make retrievers, systems differ in different countries. Following one who has had much experience of various systems, we find that the one practised by the French differs from that practised in England, equally in its process and results—it is that of force, the spiked collar being universally used; and, although this expedient is certainly a severe one, yet it is affirmed that it produces a result which the *suaviter in modo* fails to effect, except to a certain extent, in the case of the Newfoundland and water spaniel. As the *fortiter in re*, or compulsory system of the spiked collar, is harsh, and the punishment inflicted severe, it must be remarked, that the experienced breakers of France find it inexpedient to commence with any young dog till he is ten or twelve months old, the severity of the training having the effect of cowing and intimidating dogs of a younger age. The breakers would, also, seem to be averse to any previous instruction being imparted to puppies, either by children or other means, as *that* always renders *their* operations with the spiked collar more difficult. It was on one occasion mentioned to a dog-breaker of note, that a dog was about to be sent to him to be taught, and that it had already received some instructions by gentle means, and that he would fetch and carry tolerably. His reply was—"*Tant pis. J'aurai plus de peine avec ce chien la; il sera plus entêté, et plus difficile à dresser.*" This circumstance is alluded to, because an opinion is by no means uncommon, that dogs should be taught to fetch and carry as soon as they are able to run about; and some have even recommended children as their best instructors; and, judging from the successful results in one or two cases, have expressed themselves strongly in favour of this method, intimating it to be the right one, and that universally practised in France. With every deference to such sportsmen, it may safely be thought that they are making a rule of the exception, and, at the same time, confounding two things which are totally dissimilar, as the compulsory system differs "*tutto cielo*" from the mild and gentle one, both in its process and in its results. It is readily admitted that you cannot begin too early to teach dogs to be docile and obedient, and to impart preliminary instruction to them, *when* it is intended to teach them to fetch their game by gentle means; but it cannot be conceded that children are the best instructors, because experience has frequently shown that they are the very worst if a dog is expected to carry anything beyond a ball, a stick, or a stone, and to be used for sporting purposes—simply because dogs, taught by children, are generally in the habit of playing with whatever they fetch and carry, and rarely or ever pick it up at once, or immediately return with it when they *have* picked it up. On the contrary, they mostly drop it several times, and, after finally securing it, commence a series of gambols before they return, infinitely to the delight and satisfaction of themselves and the children with whom they are playing. The consequence of this is, when a dog so taught is taken into the field, he is almost certain to mouth his game, drop it, and pick it up again several times, leaving the ground covered with feathers; and, perhaps, when he finally seizes the bird, he will stand wagging his tail, looking his master in the face with infinite satisfaction to himself, as he has been in the habit of doing with his instructors, which, doubtless, pleases the children, and excites their benevolent attachment; but it is,

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nevertheless, very vexatious and annoying to the sportsman. Many dogs of this description have been taken to the field; and, in a preceding page, we have adduced an instance in the field; but they never can be depended on, except, perhaps, Newfoundlanders, or water spaniels, as these two races of dogs are easily broken to bring their game either on land or from the water, their instinct inducing them strongly in that direction, although it may be doubted whether they are ever so perfectly taught by gentle, as by compulsory means. Dogs taught to fetch their game by gentle means have been pronounced uncertain in their obedience; on some days taking the water unhesitatingly, and bringing perfectly; and, on others, no earthly power being able to induce them either to take water or to fetch their game. This generally occurs whenever anything has arisen to ruffle their tempers. Indeed, we have heard of a Newfoundland, a first-rate retriever, who had been taught by gentle means, and who, when sulky from being scolded or thrashed, would not stir one inch; whereas we have never known a dog refuse to go and fetch his game either on land or from the water, whatever his breed might be, who had been thoroughly taught with the spiked collar by a competent instructor.

Although this "uncertainty" and "sulkiness" may have, in some instances, exhibited themselves, we are far from believing such exhibition to be either general or conclusive that severe measures are the best for breaking or training a dog. We have seen the effects of gentleness upon the horse; and we have no doubt that gentleness used towards the dog is by far the most potent and effective educator. In proof of this, the following account of a canine performance, which took place in London some years ago, will be found exceedingly interesting. It was published in the *Lancet*.

"Two fine dogs, of the Spanish breed, were introduced by M. Léonard, with the customary French *politesse*—the largest, by the name of M. Philax; the other, as M. Brac (or Spot). The former had been in training three, the latter, two years. They were in vigorous health; and, having bowed very gracefully, seated themselves on the hearth-rug, side by side. M. Léonard then gave a lively description of the means he had employed to develop the cerebral system in these animals; how, from having been fond of the chase, and ambitious of possessing the best-trained dogs, he had employed the usual course of training—how the conviction had been impressed on his mind, that by *gentle usage, and steady perseverance* in inducing the animal to repeat, again and again, what was required, not only would the dog be capable of performing that specific act, but that part of the brain, which was brought into activity by the mental effort, would become more largely developed; and hence a permanent increase of mental power be obtained. This reasoning is in accordance with the known laws of the physiology of the nervous system, and is fraught with the most important results. We may refer the reader, interested in the subject, to the masterly little work of Doctor Verity, *Change Produced in the Nervous System by Civilisation*. After this introduction, M. Léonard spoke to his dogs in French, in his usual tone, and ordered one of them to walk, the other to lie down, to run, to gallop, halt, crouch, &c., which they performed as promptly and correctly as the most docile children. Then he directed them to go through the usual exercise of the *manège*, which they accomplished as well as the best trained ponies at Astley's. He next placed six cards of different colours on the floor, and, sitting with his back to the dogs, directed one to pick up the blue card, and the other the white, &c., varying his orders rapidly, and speaking in such a manner, that it was impossible the dogs could have executed his commands if they had not a perfect knowledge of the words. For instance, M. Léonard said, 'Philax, take the red card and give it to Brac; and Brac, take the white card, and give it to Philax.' The dogs instantly did this, and exchanged cards with each other. He then said, 'Philax, put your card on the green, and Brac, put yours on the blue;' and this was instantly performed Pieces of bread and meat were placed on the floor, with figured cards, and a variety of directions were given to the dogs, so as to put their intelligence and obedience to a severe test. They brought the meat, bread, or cards, as commanded; but did not attempt to eat or touch unless ordered. Philax was then ordered to bring a piece of

meat, and give it to Brac; and then Brac was told to give it back to Philax, who was to return it to its place. Philax was next told he might bring a piece of bread, and eat it; but, before he had time to swallow it, his master forbade him, and directed him to show that he had not disobeyed, and the dog instantly protruded the crust between his lips.

"While many of these feats were being performed, M. Léonard snapped a whip violently, to prove that the animals were so completely under discipline that they would not heed any interruption.

"After many other performances, M. Léonard invited a gentleman to play a game of dominos with one of them. The younger and slighter dog then seated himself on a chair at the table, and the writer and M. Léonard seated themselves opposite. Six dominos were placed on their edges, in the usual manner, before the dog, and a like number before the writer. The dog having a double number, took one up in his mouth, and put it in the middle of the table; the writer played a corresponding piece on one side; the dog immediately placed another correctly, and so on, until all the pieces were engaged. Other six dominos were then given to each, and the writer intentionally played a wrong number. The dog looked surprised, stared very earnestly at the writer, growled, and finally barked angrily. Finding that no notice was taken of his remonstrances, he pushed away the wrong domino with his nose, and took up a suitable one from his own pieces, and played it in its stead. The writer then played correctly; the dog followed, and won the game. Not the slightest intimation could have been given by M. Léonard to the dog; this mode of play must have been entirely the result of his own observation and judgment. It should be added that the performances were strictly private. The owner of the dogs was a gentleman of independent fortune, and the instruction of his dogs had been taken up merely as a curious and amusing investigation."

Mr. Richardson adduces the following:—"Some years ago, a Spaniard, named Germondi, exhibited a company of performing dogs in the different towns of Great Britain and Ireland. In Dublin, where he made some stay, he occupied, with his company, the large building at the corner of D'Olier Street, which is now the handsome shop of Messrs. Kinahan. The performances of these dogs were extremely curious. They danced, waltzed, and pirouetted. One, in the costume and character of a lady, sat down to a spinning-wheel, which he kept in motion for a considerable time.

"The company was divided into two groups; one half appearing in dresses of a red colour, and the other being attired in blue. The blues occupied the model of a fortress, which the red troop attacked, drawing up their artillery in front, and opening a heavy fire upon the enemy, which the blues returned with their cannon from the fortress. The reds were, however, at length, victorious; the fortress tottered, and the reds dashed across the defences. Suddenly the works blew up with a tremendous crash, and several dogs, on both sides, lay motionless as they fell, apparently severely maimed, if not entirely dead. When the effects of the explosion had died away, the proprietor advanced, and pulled the performers about as dead dogs, to the no small horror and amazement of the spectators; but immediately, on the dropping of the curtain, the apparently wounded, or dead dogs sprang to their feet, and resumed their proper places.

"The next scene introduced one of the dogs as a captive between two of his comrades, all attired in military costume. The captive, being condemned as a deserter, was sentenced to be shot, and the sentence was carried forthwith into execution by his canine comrades. On being fired at he fell, struggled convulsively for a few seconds, then apparently died; in this state he was dragged about the stage; his comrades then placed him in a barrow, and wheeled him away. He subsequently appeared placed in a bier drawn by dogs, with likewise a canine driver, who flourished a whip over his companions, and, with a procession of the whole company, attired as soldiers, moved slowly to the solemn dead march, deposited their comrade in the grave, and thus concluded their performance. These dogs were of various descriptions—pugs, poodles, mongrels.

"There was an interlude of young puppies, who tumbled head-over-heels in various diverting attitudes; after which he introduced a fine specimen of bulldog, which the exhibitor called his fire king. This dog was trained to

exhibit in the midst of a brilliant display of fireworks, and nothing could exceed the courage he preserved when wholly surrounded by flames, or the resolution he manifested not to quit his position until the fire was entirely extinguished. All this was the result of gentleness.

"'Many a good
And useful quality, and virtue too;
Fidelity that neither bribe nor threat
Can move nor warp; and gratitude for small
And trivial favours, lasting as the life,
And glistening even in the dying eye.'"

We must now, however, return to the spiked collar. The impression produced by this instrument is never effaced; so much so, that a smooth-haired, high-bred pointer will not refuse to go into a river in the coldest and severest weather in winter, although he will, perhaps, shiver on the bank at the very sight of it, before plunging in. We have heard of dogs of this description, which had been thoroughly broken by compulsory means, and they never refused to go into the water, although they might sometimes hesitate in frosty weather; but the instant the magic words "*Collier de force*" were uttered, they plunged in with all the alacrity imaginable. Such dogs, however, ought not, as a rule, to be taken out on such occasions. It may be further questionable whether pointers ought to be taught to retrieve; and as a rule it is perhaps wrong; but, in a country where snipes are abundant, and are the principal objects of the sportsman's pursuit, it is, we think, advisable that all his dogs should be taught to fetch and carry, in case of accident to the regular retriever; because it will occur every day that some few snipes will fall in places not easily, and sometimes not safely, accessible to the sportsman; and all sportsmen know how vexatious it is to lose a bird after he has been killed, and how tantalising it is to see him lying almost within reach, and yet be obliged to leave him. This will occur even in grousing, in the case of a towering bird falling into a fresh-water loch; and where there is no retriever the bird must be left and lost. This, however, is a rare occurrence; but in snipe-shooting, in most marshes, it will happen often to the sportsman, if he has not a retriever with him: in fact, no sportsman of any experience will either go out snipe or duck-shooting without being accompanied by a first-rate retriever; and even then he must make up his mind to lose some few birds, if he is shooting in the immediate vicinity of the sea, as both widgeons and ducks will occasionally fly some distance when they are wounded, and drop dead; and, if they happen to fall in a strong outward current, they are soon carried beyond the power of any retriever. Indeed, sometimes blackcocks, which have towered after being shot, and fallen out a good distance at sea, have been lost; and woodcocks also (as these birds tower sometimes) are apt to be lost in the absence of retrievers.

Leaving this incidental digression, we now return to the system of training. The two great advantages arising from the compulsory system, when it has been carried thoroughly into effect by a first-rate hand, consists, in the first place, in the complete obedience and thorough docility exhibited on all occasions on the part of the dog, as he never refuses to search for and bring his game when ordered to do so, either on land or from the water, irrespectively of the weather; and, in the next place, which is an important feature characterising this system, he invariably picks up his game *at once*, without mouthing it, and returns to his master immediately. The reverse of this, it is said, is the case with dogs taught by gentle means—even with the spaniel and Newfoundland; and some very good ones, excellent in every respect, with the one exception of not returning directly and promptly with the game they had in their mouths to their master, have been known.

With regard to dogs instructed by children to fetch and carry, a writer says, he had the ill-luck to be the purchaser of one through the instrumentality of a friend; and the result is so much to the purpose, that he relates some of the circumstances connected with the purchase, possession, and trial of the said dog. Having taken up quarters for a little snipe and duck-shooting, in a favourite locality, he found himself much in want of a good retriever, and applied to a friend resident in London, giving him *carte blanche* as to price. The friend shortly replied, stating that he had purchased a first-rate retriever for £10—a beautiful Newfoundland, warranted to retrieve perfectly on land and from the water. He

observed that, although the dog's teeth were somewhat damaged, he was perfectly young and fresh, the teeth having been injured in consequence of his recent instructors—the children of the family from whom he was procured—having given him considerable practice in fetching up stones from the bottom of a river which passed through their garden. Broken teeth in a retriever were, of course, not objectionable. When the dog arrived, the purchaser was certainly very much pleased with his appearance, as he was as handsome a Newfoundland as he had ever seen, and fancied he would answer the purpose exactly; which favourable opinion of him was confirmed after the two or three first days' duck-shooting, as he brought all his birds perfectly; but it so happened, that every duck killed fell on the near side of the river; and on going out on the fourth day, some ducks were killed, which fell on the opposite side, nearer to the farther bank, when, greatly to the sportsman's astonishment and annoyance, the retriever, after taking the water in his usual gallant style, and possessing himself of his bird, swam out on the other side of the river, where, after depositing his bird, he commenced rolling himself on the grass, and, after having well shaken himself and performed a variety of gambols, returned very quietly, leaving his bird behind him, as doubtless he had been in the habit of doing with the stones thrown into the river by the children, whenever accident or caprice induced him to go out on the reverse side. He tried his utmost to persuade him to go back and fetch his bird, but without success, the bad habit acquired from the children being inveterate; as, on every occasion of a bird falling near the opposite bank, he acted in a similar manner. As a temporary remedy, during the short time he retained possession of this dog, he made his game-carrier take a long cord with him, which he fastened to the dog's collar whenever any bird fell into the river at a distance, so that his attempt to go out on the further side was not only checked, but he was conveyed safely to the proper shore. This plan was pursued for some time, thinking it might, perhaps, break him of his bad habit; but this was not the case, as, on relinquishing the cord by way of experiment, he immediately committed his first offence; and, finding him incorrigible, he was presented to a family, where he afforded the greatest satisfaction, being a safe playfellow for the children by day, and a faithful and vigilant guardian by night.

Dogs taught by children generally acquire a variety of bad habits, which totally unfit them for sporting purposes. We have no doubt, however, that there are exceptions, and that some few sportsmen may possess dogs so instructed, which are perfect; but these neither establish a rule, nor militate against the one on which we insist. Dogs generally are so docile, that we are predisposed to believe anything which may be related of any one particular dog; but still, when animals are to be trained for specific purposes, it appears to us to be judicious to adopt that system which has been pursued with unqualified success by those who have devoted all their time and attention to it, purely as a matter of business; as it must be recollected that dogs, like human beings, vary much in temper and disposition. It is, therefore, presumable that those who break the largest number of them are more likely to discover the best mode of proceeding with, and treating them, than those whose practice and experience have been confined to a few, and those, perhaps, of one particular breed. A French dog-breaker will undertake to break, and will succeed thoroughly with, any breed or race of dog, provided he be about twelve months old. It therefore appears to us that it must be conceded to them that their system is a good one. "We speak advisedly on this point," says a writer, "as we have seen various cross-breeds of dogs, which had been taught by French breakers, bringing their game perfectly; and, on one occasion, on our questioning one of these heroes of the *collier de force* on this particular point, his reply was—'*N'importe quelle race; aussitôt que je mets mon collier il faut cela marche, sacr-r-r-r-r-ré nom de chien.*' We have shot to several pointers and setters broken by the same man, all of which brought their game perfectly, never disturbing a single feather, and always returning the instant they picked up their birds. This latter result is produced by giving the spiked collar a sharp jerk in the *first* instance, the moment the dog under instruction picks up whatever is thrown out

for him to fetch, in the event of his not returning with it immediately, omitting this infliction when he returns promptly, so that the fear of receiving this punishment produces an alacrity which is never abandoned, and which is so agreeable to the sportsman. When setters have undergone the ordeal of the *collier de force*, they give the sportsman comparatively little trouble when he wishes to instruct them to back and stand. Having been made docile and obedient, more than half the difficulty is overcome."

As some of our readers may not be aware as to what sort of an instrument the *collier de force* is, we may explain that, in France, it may generally be obtained at the shops of the gun-makers and saddlers. It is composed of thick but pliable leather, stout nails of about three quarters of an inch in length, and two semi-circular pieces of iron. "The collar may be two inches in breadth; length, about three inches shorter than the circumference of the dog's neck, for whose use it is intended; having at each end the semi-circular piece of iron firmly secured by the broad end of it; its strength being that of an ordinary buckle of a dog's collar, and being an inch and a-half in length; so that the extreme ends, when drawn tightly by one of the cords, will meet. As there must be two cords, one to lead the dog by, the other to inflict punishment—the former will be fastened to both rings; the latter only to one, but passing through the other; so that, when it is pulled, the collar is of necessity contracted, and the nails forced into the dog's neck. The two pieces of leather of which the collar is formed, are of similar size and shape, the under one being rather the thinner of the two. It is through this that the nails are introduced, the flat heads lying compactly between the two, and kept steadily and firmly in their position by strong sewing. The cord used is generally from twenty to thirty yards in length."

With the above implement, the dog under instruction is forced gradually to do whatever his instructor requires of him. Several objects are thrown out to be fetched and carried—sometimes, a piece of wood, of about nine inches in length, in the shape of a rolling pin, with two small pegs passed through at each end, so as to facilitate the dog's picking it up; at other times, either a stuffed bird or an old hare skin, tied up in a bundle; but the piece of wood is generally made use of in the first instance. The first difficulty is to make the dog pick up whatever is thrown down; when this, as it were, *premier pas*, is accomplished, the subsequent instruction is easily, although only gradually imparted, as continuous daily lessons must be persevered in for the space of a month, before the dog will be thoroughly taught to fetch and carry on land, without the risk of disappointment; and after this is accomplished, as we have already intimated, the second course of education, which consists in forcing him to take water without flinching, and bringing his game instantly from it, will occasion quite as much trouble as has been previously incurred, and occupy about the same length of time; a shallow piece of water being selected for the necessary manœuvres, and during the summer months—this season being most suitable, as the obstinacy and resistance of the pupil will frequently necessitate the entrance of the instructor into the water. "As we have frequently witnessed dogs under this species of instruction," says the anonymous writer to whom we are indebted for the information contained in this part of our subject, "we are well aware of all the difficulty and trouble involved in it; but when it is once thoroughly carried out, the sportsman will have the satisfaction of possessing a dog on whom he can invariably depend, without the slightest fear of disappointment; and we do not believe that this can often be said of dogs that have been taught by gentle means."

We will now direct our remarks to the various methods of breaking and training pointers and setters to stand, back, down charge, and conduct themselves properly in the field and on the hill; and if we have spoken highly of the French system of breaking retrievers, we cannot say much in behalf of their method of training pointers and setters, as it is radically bad—repudiating the very first principle of the strict adherence to which the success of all subsequent sound instruction must depend; namely, that of down charge and dropping to hand; as these are not only not taught in France, but universally discouraged, inasmuch as every dog is expected

to run in immediately after a shot is fired, pick up and bring whatever game is killed; and in the case of a hare being shot at and wounded, to chase and do his best to catch the hare; and, if he is absent half an hour, provided he returns with the hare, his master is highly delighted, and considers him a first-rate dog. We have seen some hundred pointers and setters—at least what are called so—and never saw one that either went down to charge, or that did not invariably chase. As all dogs are naturally disposed to chase, the highest bred ones as well as mongrels, it is not to be wondered at that when they meet with constant encouragement they should accomplish this feat to perfection.

There are various methods of breaking pointers and setters, recommended by different sportsmen and gamekeepers; and although there is some difference of opinion as to which are most advisable to be employed, there is none as to what the results ought to be. A good dog is expected to go down to charge, drop to hand, stand, back, carry his head high, range well, and quarter his ground in the most advantageous manner.

The natural requisites in pointers and setters are good breeding, perfect symmetry, and fine nose. The two latter qualities are generally consequent on the first, as it is rare to find a well-bred dog that is not well made and has a good nose. Admitting this position to be correct, attention to breeding becomes important; and, supposing a sportsman to have a first-rate female, either setter or pointer, we should recommend him to spare no trouble or expense in procuring or sending to the best dog he can find; and if he selects a dog that is unexceptionable in every respect, there will be little liability to disappointment. Differing from opinions given by some excellent sportsmen, we should say that it is best not to breed constantly *in-and-in* with dogs used in the sense of breeding from dogs nearly related one to another, as we have good reason to believe that the produce of such connections would be physically degenerate, and most probably deficient in sagacity. We cannot explain the physiological reasons for this result, as these, like many other operations of nature, we fancy are beyond our intellectual range; but we think we may safely affirm that the law of nature is universal in this respect, and therefore should not be disregarded. Herdsmen, farmers, shepherds, gardeners, and breeders of horses and cattle, are all well alive to the fact that breeding *in-and-in* produces degeneracy: it is discernible in plants and seeds as well as in animals—in potatoes and wheat as well as in sheep. No good farmer will sow two years consecutively wheat in the same soil that produced it; and intelligent gardeners seek for change of seed. Shepherds, also, who have the care of large flocks of sheep, make changes every two years, too obvious to be more than hinted at, and find these necessary to avoid degeneracy. We refrain from going further into the particulars of this law of change, compliance with which is manifestly universally required by nature for the maintenance and advancement of our general interests, inasmuch as the subject, in *all* its various bearings, however interesting and important, is not likely to be settled by us. In support of these views, some very valuable information has been advanced on the subject of breeding fowls, not for the purpose of exhibition, but for the more important object of utility, where it is stated that, by following the law of change (*i. e.* crossing), heavier, finer, and more marketable fowls are produced; and it should be remembered "that the exhibition of birds is only a *secondary* consideration when compared with their commercial utility."

In proceeding with the method of training and breaking pointers, and setters, we will assume, for argument's sake, that a young dog is well bred, of good shape and make, and about twelve months old, and just brought home from his walk to be taught everything which a pointer and setter ought to learn. The first thing to be done is to make him thoroughly docile and obedient, to know his name, to come immediately when called, to drop to hand, and not to move till he is allowed to do so. To produce these results, some use a collar with a cord; some the spiked collar with the cord also; and others exert moral influence aided by the whip. The merit and success of each plan will depend much upon a dog's temper, as there is much difference in this respect; so that what would produce success with one dog would entirely fail with another. The breaker must, therefore, be

guided, in a great measure, by circumstances. If a dog be of mild temper and naturally docile, neither collar nor cord will be required, and he may be made to go down without having recourse to severe means; in which case it will be merely necessary to place him at a particular spot, and keep him down with the hand, pronouncing audibly at the same time the words "Down, down!" giving a stroke or two with the whip, in the event of his evincing a disposition to move; and, when he is thus far obedient, his instructor must retire from him, like a courtier after kissing hands, keeping his eye upon him till he reaches a distance of forty or fifty yards, holding one hand up, and not permitting him to move till he either calls, whistles, or makes a movement with his arm. In the event of his moving before he is ordered, he must be taken back to the precise spot where he was first placed, and made to lie down; and this lesson must be repeated till it fully succeeds—by which we mean, until the dog goes down at all times the instant the words "Down, down!" are pronounced, the hand being invariably simultaneously held up. The object of this is, that the dog may ultimately go down and back at all times on his seeing the hand raised, without its being necessary to call to him, as speaking would be disadvantageous when birds are wild; it being expedient, when having a brace of dogs at work, to make one dog stop instantly by a silent signal when his companion may have suddenly made a point unperceived.

When the above means are found insufficient, the collar with a cord may be used; and some think the spiked collar will prove more effectual than the plain one, with a cord of about five yards in length, the end of which can either be held by a boy, or fastened to a stake. When this first lesson is imparted, the efficacy of this plan will soon be perceived, if the dog is at all unruly or obstinate, by his gradual and progressive obedience. In the first instance he may resist; but when he discovers that he can neither escape nor avoid punishment if he disobeys, he will yield to his instructor, and go down when required. The greater the difficulty, the more certain and implicit will be the obedience, when the former is once thoroughly vanquished. Should the dog rise without permission, or move, he must be forced back to the precise spot, and made to go down, receiving at the same time several sharp jerks with the cord, and the same method of instruction adopted as we have just suggested. This mode of inflicting punishment is preferable to the use of the whip, as following immediately any act of disobedience; it is more intelligible to the dog, and makes a more lasting impression, consequently is more effective.

When this lesson has been thoroughly and completely inculcated, so that the dog is under perfect command, and will go down instantly he is called to, or on the hand being raised, then he ought to be taken out and taught to range his ground. The day should be fine and suitable; a slight breeze would be all in the dog's favour; more than that would be prejudicial. In the first instance, it will be better to go where game is thin; and, when he is somewhat fatigued, to where it is more abundant, especially if he has evinced symptoms of progress. It must be expected that he will chase in the first instance; but if the collar and cord be on him, as they should be, these will check him considerably; but, on each occasion of his committing any offence, by either running in or chasing, he must be caught and spoken to sharply, and receive a few smart jerks with the cord—"Down, down!" being several times simultaneously repeated. A steady old dog, taken out with the young one, will afford considerable facility in imparting instruction, particularly if they are acquainted with each other, as the young dog will naturally look to the old one, watch his movements, and go to him when he makes a point. On these occasions, the breaker must get up as promptly as he can, in order that he may exercise all his influence in encouraging his pupil if he is doing right, and in restraining and punishing him if he is disobedient. The chances are in favour of a dog's running in the two or three first times, although he should make a short temporary point, in which case he must, on each occasion, be caught, spoken to sharply, and receive punishment; and, should he continue to run in without showing any visible signs of amendment, then it will be advisable to take a boy out to hold the cord, so that he may receive prompt and immediate punishment, if he attempts to dash forward, either on his

seeing the old dog point, or on his perceiving birds rise, or on their falling if a gun be used. Three days' perseverance in this system have been known to succeed in making a dog perfectly staunch in backing, as well as pointing. It is advisable, especially if dogs are very high couraged, to let them have a little liberty, and not to be too severe for one or two days, and to allow the wire edge to be somewhat taken off, before stringent measures are had recourse to; the highest couraged dogs are generally the wildest at starting, but, when once broken, prove the best and staunchest. After one good point has been made, and a disposition evinced to yield to sound discipline, the progress is rapid; *then* no single fault must be overlooked, however trifling, and every care and attention is demanded of the breaker.

An indispensable requisite to all good dog-training is, to begin early. There is likewise another valuable ingredient in the art, namely, that the words of encouragement or reproof be always uniformly adhered to. The following is a kind of catalogue of phrases, or dictionary words usually connected with the subject. The word *Steady!* ought to be used when all dogs enter a field, especially young ones. *Take heed!* implies the same thing. When a dog is seen very busy and active with his nose and tail, feathering as he hunts, then the word *To-ho!* in a mild, but sufficiently marked and loud tone for the animal's hearing should be used, to cheer as well as to inspire caution. *Down! or Down Charge!* is a command to the dogs to crouch, or drop the birds. *Back!* brings the dogs back again to your feet. *Seek out!* sends them off again in quest of game; but a *wave of the hand* is considered much better where it is expected birds are near. *Hie on!* gives a spur to the timid dog to leave your feet; and *Seek out!* orders him to hunt. *Go seek!* should be impressed on a dog's memory as a command to look out for something considered as lost, or wanting; and the term is distinguished from *seek out*, by dogs that are properly trained. *Hold up!* is used to prevent the dropping of the nose to the earth to catch the scent, which, although the odorous particles may not have disappeared from the spot the birds stood on, are chiefly floating in the air; consequently, by holding up his head down wind, he comes in contact with the scent of the birds almost immediately. The puzzle peg is used as a last resource when *Hold up!* is not attended to.

Ware! is a word of caution; and *Ware Hare!* is to check the animal from running after the hare, when partridges, grouse, or pheasants are at hand. It is a good device to accustom a dog to atttend to *signs* as well as words; for a wave of the hand will often do more execution than loud shouting.

The pairing season is a good time to break young dogs, as birds lie well; and this is an important point, and not to be disregarded. It would not only be detrimental to make the attempt with wild birds, but, in all probability, end in complete failure, and give the breaker considerable additional trouble on a future occasion. If a dog is not intended for the moors, and only for the marsh and field, then snipes are excellent birds to introduce to his notice, especially the Jack snipe, as he lies remarkably close, and a few of these shot on the ground, before the dog's nose, make him remarkably staunch.

When dogs are commenced to be taught to range, give them the wind as much as possible, but never persevere long in one direction; but, on the contrary, change your course constantly, alternately right and left, so as to induce your dog to watch your movements, without its being necessary to speak to him, by which means, if you are successful, he will subsequently beat his ground exactly as you desire, being influenced by your movements, which is a great advantage.

When a dog is beginning to learn his business and becoming steady, it is not a bad plan to go at right angles to the wind, as, in the event of his picking up a bird or two, and being merely scolded and made ashamed, he will be more careful and carry his head better when he goes partially down wind; and, moreover, when he points, will give you an opportunity of heading him, whereby you can put his patience and staunchness to the test, and will, at the same time, cure him of "blinking," if he has ever shown any disposition to do so, which means leaving a point after it has been made, and coming back to the gun—not a common fault, but one which sometimes occurs.

The very best of dogs will sometimes put up a bird; therefore a dog must not be condemned on his first trial if he commit a fault, but be rather judged by his general conduct. In grouse-shooting sportsmen like to give their dogs the wind as much as possible; but when birds are wild there is sometimes an advantage in going down wind with one old steady cunning dog, who will "sink" the wind, and get beyond running birds and head them, in which case even wild old cunning cocks, on finding themselves between two enemies, will allow the sportsman to get within shot. We are aware that this is not the regular mode of proceeding; but it is one of the many expedients which may be resorted to when birds are wild at the end of the season.

Setters and pointers may be either broken in the shooting season, or out of it, with, or without the gun; if without the gun in the pairing season, the breaker must take with him a horse-pistol, which he can discharge on the rising of birds, in order to accustom the young dog to the sound of the report, and also to make him down charge. The shooting season we think is the best time to complete the education of a dog, provided the sportsman is disposed to take the trouble on himself, and has patience to pay the requisite attention; a few shots may be lost at starting, but the progress of the dog is rapid, if he is well tired down each day, and plenty of game found and killed to him. At the commencement much work and little game is best for a young dog; but when he begins to behave well, he requires the encouragement of more game, but without diminution of work. There is little difficulty, we apprehend, in breaking a well-bred dog, provided the proper preliminary measures which we have suggested be strictly attended to. Well-bred pointer, and setter puppies, have frequently been seen to back and stand instinctively; and most sportsmen who have resided much in the country, we have no doubt, have constantly witnessed young dogs in a farmyard pointing all sorts of poultry.

Before concluding these remarks, we must notice one fault occasionally to be found in puppies, which must be counteracted—it is that of carrying their heads low, and endeavouring to make out scent as a spaniel would do. The remedy for this is an implement called a puzzle, made of iron, fastened in such a manner that the dog is obliged to carry his head high. The above fault is rarely found in high-bred dogs; they almost invariably carry their heads well—an advantage which the experienced sportsman appreciates; his legs are saved, and he procures good sport, where second-rate dogs would have completely failed.

The other dogs, more especially of the spaniel kind, are the Cocker, the Springer, the Blenheim Spaniel, and the King Charles' Spaniel. They are all, more or less, adapted for the field.

THE COCKER.

This dog is like a small land-spaniel, but with a shorter muzzle, a more rounded head, and longer ears. He is a lively little animal, and is used to spring woodcocks and pheasants in copses and thickets, where larger dogs cannot enter. He is very hardy, and never seems to tire at his work. He may, therefore, be hunted for days together; but he is difficult to keep under command, and he gives tongue loudly.

THE SPRINGER

Is only a larger-sized cocker, heavier in make, and neither so active, nor so lively as the other.

THE BLENHEIM SPANIEL.

"Blenheim Palace, near Woodstock, Oxfordshire," says Mr. Richardson, "was formerly the estate of King Ethelred, and since that of Henry II., as also the birthplace of several princes of the royal line of England; subsequently the prison of Queen Elizabeth, during a portion of Queen Mary's reign; and afterwards granted by Queen Anne to John Duke of Marlborough, with the present palace, for his great victory over the French and Bavarians, at the village of Blenheim, in Suabia, A.D. 1704. In this superb mansion has been preserved, for the last century and a half, the small red-and-white spaniel, or comforter, the "Pyrame" of Buffon—the Blenheim spaniel of the present day. Except for their beauty and attachment, they are of but little use, although some of the breeds bring a long price. From their restlessness, and proneness to give tongue on the least alarm,

they make excellent watch-dogs inside a house."

THE KING CHARLES SPANIEL.

This breed is distinguished by the shortness of the muzzle—the round and bullet-like shape of the head—the prominence of his eye—the length of his ears—and his *colour*, which must be black and tan. The *Suffolk Sportsman* says—"the cocking or gun-spaniel of true perfect breed is of one general or whole colour; either black, or black and tan, commonly called King Charles's breed, or red in different shades, paler and deeper;" and concluding with "legs short and breeches behind." This diminutive animal was the favourite of King Charles II., who had some of this kind constantly with him in his walks, and who was more partial to his dogs than to his duties as the sovereign of a great people. The breed is preserved in the family of the Duke of Norfolk, at Arundel Castle, where they are fondled and petted, we believe, in such a manner, as to lift them to the dignified position of being regarded as members of the family. James II., of unfortunate memory, was, also, extremely partial to these dogs, hence they have received the title of "the royal race," and are now generally regarded as such.

In London, where these dogs are bred with great care, and to the highest degree of perfection, the Blenheim is frequently crossed with the Charles, so that the variety of colour on which the difference of nomenclature depends often appears in the same litter; the black and tan being denominated "King Charles," and the red and white "Blenheim."

Several "spaniel clubs" have been formed, with a view to promote the careful breeding of these dogs; and of some of these His late Royal Highness the Prince Consort was patron, both her majesty and the prince being enthusiastic admirers of them. His Royal Highness had, at no sparing outlay, erected a superb kennel for them at Windsor.

The members of the spaniel clubs subscribe a small sum each, and, with the amount contributed, a handsome collar of silver, with gold entablature, is purchased; a particular day is then named, and judges are appointed, when each member brings to the club-room a dog of his own rearing, and that dog adjudged to possess the greatest number of good points attains the collar as a prize.

King Charles and Blenheim spaniels have been known, in London, to fetch the price of from 150 to 200 guineas!

The affection of these dogs for their owners is extreme; and their general intelligence is such, that they would seem almost to participate in the pleasures of a quiet drawing-room conversation, when carried on by those who are attached to them. They are capable of *serving* in the field, but their continual yaffing is very apt to mar the sport. They, however, like other dogs of the species, could undergo the process of training, and be made of considerable use in some kinds of hunting. In England, however, they live for other purposes—for admiration and a couch in the lap of a lady, where we will leave them to make the following extract from Mr. Blaine:—

"The old Marquis of Granby was the owner of a very celebrated breed (of Spaniels); and, in later times, the Duke of Marlborough, and his descendants, have been famed for what was known as the Blenheim breed; and the late Lady Charles Spencer, with whom we were on terms of intimacy, kept numbers of them, and was so devoted to their welfare, that, we believe, she never wore a pin in any part of her dress, fearing that it might be accidentally the means of wounding one of these favourites. They were, one and all, red and white, zealous hunters in the field, but required much trouble to break. A still more notorious variety, was the black and tan spaniel of King Charles, which continued to be cultivated with such jealous care, by the late Duke of Norfolk, that no interest could obtain one without a strict injunction from the owner, and almost a solemn promise from the receiver, that he or she would not breed from it in the direct line. The late Duchess of York, who honoured us with much condescending notice, by sending for us frequently to Oatlands, either to consult us on the ailments of the poor around her, or on her brute favourites, of which, it is well known, she had a varied assemblage, afforded us a striking proof of what we have stated. On one occasion, when we were accompanying her royal highness to her menagerie, with almost a kennel of canine favourites behind her, after drawing our attention to a jet black

pug pup she had just received from Germany, she remarked, that she was going to show me what she considered a present of much greater rarity, which was a true spaniel of king Charles's breed, sent to her by the Duke of Norfolk. 'But,' she observed, 'would you believe he could be so ungallant as to write word, that he must have a positive promise, not from myself, but from the Duke of York, that I should not breed from it in a direct line?' It would almost seem that the word of ladies of high rank was not in equal estimation with that of the gentlemen of the same rank, at least that Norfolk's duke did not think it so; for it happened, a very little time after, when professionally waiting on the Princess Sophia of Gloucester, her royal highness, also, showed us a very fine young spaniel of the Norfolk breed, which she, likewise, observed was only presented by the duke on an understanding guaranteed, not by herself, but by her brother, the Duke of Gloucester, that it should not be bred from in the Charles's line. Whatever view we take of these restrictive attempts," adds Mr. Blaine, "we may, however, be assured that Nature will frustrate them; for not only is the Norfolk breed, but the Blenheim also, sufficiently common at the present time; and they ought to be, for both are great ornaments to the race, and make very many springers. We think it our duty, likewise, to observe, that however some ladies might not think themselves strictly bound by an agreement on such a subject, we feel assured that neither of those we have noticed on this occasion would have done other than strictly abide by the compact; and we are confident that those who were much better acquainted with them than we could possibly be, would bear us out in our assertion."

THE NEWFOUNDLAND.

The Labrador and Newfoundland dogs are often confounded together. The Labrador dog exceeds the Newfoundland animal in point of size, and is often of extraordinary dimensions. A fine specimen, measured some time since, gave the following particulars:—Total length, including the tail, six feet three inches; height at shoulder, two feet six inches; length of head from occiput to point of nose, eleven inches; circumference of chest, three feet one inch. In Labrador, these powerful and intelligent dogs are used for drawing sledges, and are of great service to the settlers.

Newfoundland dogs are of less stature, but more compactly built, and are muscular and sagacious. These animals are also used for drawing sledges, and little carriages laden with wood, fish, and other commodities, and are very valuable in their native country. Both the Labrador and Newfoundland breeds are admirable water-dogs, and make excellent retrievers. Their fidelity and attachment to their masters are well known, and all are familiar with instances in which human beings, about to perish in the water, have owed their life to the courage and exertions of these devoted creatures. Mr. Blaine classes the Newfoundland dog with the spaniels—a classification from which Mr. Richardson dissents. He makes a distinct group of the Newfoundlands, which he denominates a wolf-group.

"I am compelled," he says, "thus arbitrarily to give, perhaps, an undeserved name to the present group; but it is the only one by means of which I can accurately indicate the family of dogs to which I refer. The individuals of which this group is composed, all bear a greater or less resemblance to the wolf, in erect, or semi-erect ears, in long and shaggy coats, and bushy tails. The Newfoundland dog is fully entitled to be placed at the head of the group; from his being better known than the others, from his greater beauty, his sagacity, his nobility of nature and disposition, his utility to mankind, and the high degree of estimation in which he is held in every part of the world where he is known. Those who have grouped these dogs with the spaniels, are in error, for they possess none of the characteristics of that group.

"The true breed of Newfoundland," he continues, "is a dog of moderate stature, seldom exceeding twenty-six or twenty-seven inches in height; long-bodied, broad-chested, a shaggy coat, a pointed wolfish muzzle, ears small, and inclined to the semi-erect; colour usually black, with a shade of brown through it, and occasionally some white. There is another breed of dog peculiar to Newfoundland; short-coated, and sharp-nosed—an excellent water-dog, by some mistaken for the true Newfoundland breed.

"The large dogs usually known as Newfoundlands in this country, are evidently the result of a cross with the mastiff. They are a fine, showy animal; but less sagacious, less active, and more apt to display irregularity of temper than the original breed; they often attain the height of thirty inches. These large dogs are rapidly becoming the peculiar breed of Newfoundland; and dogs of this sort are gladly imported there, whereas our Newfoundland friends have now little or nothing but curs to offer in return.

* * * *

"The origin of this dog is questionable; but I am disposed to trace him to a large European variety, still in use among the Norwegians, for the chase of the bear and wolf. It is now well known that the original discovery of Newfoundland is to be attributed to the Norwegians, who, before the year 1,000, sailed from Greenland on a voyage of discovery, and that the same people discovered North America some time between the tenth and eleventh centuries."

Mr. Blaine says, "that although this dog was, without doubt, first introduced to general notice from Newfoundland, there is reason to suppose that it was originally derived from the large dogs of Spain, introduced by the early discoverers of the American continent, which, intermixing with the native breeds, produced an increase of size and power in the future races. These would be encouraged by the natives, because the use they made of them as beasts of draught were thereby better fulfilled. Such, we have reason to believe, was the first improvement made in the native dogs of those countries, which, as far as a factitious breed can continue its like, seemed, but in limited numbers, to have remained a standard among them until E.glish importations had drained almost all of them. Another variety forms the smaller, smooth aquatic dog of Newfoundland. When the English settled there, they, without doubt, carried some of the largest and most powerful of the water spaniel breed, to assist them in the hunting and the shooting of wild fowl; and there is little reason to doubt, that an intermixture with these also assisted in perfecting a breed, whence our admired specimens of the large Newfoundland dog arose; the breeding of which, however, was never carried to any great extent in that country. The rigours of the climate, and the difficulty of procuring food for it during some seasons of the year, were unfavourable to both the production of numbers, and the full development of the frame. The splendid animal we now see has been greatly increased in size, since its residence among us. We have cultivated it so as to make it now an English breed; while in Newfoundland it is at present so nearly extinct, that a writer, in a new series of the *Sporting Magazine*, states that he could not find a single dog of the kind at St. John's. If this be so, it is a mistake when naturalists assert that the dog we possess is the same with that which is employed 'in their native districts in place of the horse.'"

Of all the species of the canine race there is none exhibits so much dignity, such a nobility of nature as the Newfoundland. He is majesty itself, and seems to be conscious of the power and appearance of which he is possessed; whilst he rarely descends to the level of other dogs in combating in the streets. This does not arise from cowardice, but from the excellence of his disposition, and the high intelligence with which he is endowed. As an aquatic dog, he is second only to the water-spaniel; his feet being webbed, and that element seeming to him as natural as the *terra firma* upon which he walks. Some time ago, ten of these animals were imported into Paris, for the purpose of watching the banks of the Seine. They were overlooked by regular trainers, whose duty it was to teach them to draw from the river figures stuffed, so as to have a close resemblance to those of children and full grown persons. Commodious kennels were erected for them on the bridges, and they were not long before they became adepts at plunging into the water, and rescuing from the grave many unfortunate drowning individuals.

The sagacity of the Newfoundland is almost human; and the variety of his accomplishments are such as to place him at the very head of all the canine races. In the various capacities of watch-dog, companion, water-dog, pointer, and retriever, he has been successful; whilst the pliability of his temper, and the docility of his nature, renders him capable of

being taught anything almost, but to read and speak. His courage is great; and, as the safe-guard of a household, there is much more dependence to be placed upon him than upon the mastiff. On the authority of the *Boston Traveller*, we give the following example of the sagacity of this kind of dog, in performing some of the duties of civilised life:—

Our neighbour of the *Evening Gazette* has recently referred to a sagacious dog of the Newfoundland breed, owned by Mr. Hawes, of this city, who comes regularly to the *Traveller* counting room, every afternoon, and putting his paws upon the counter, receives his master's paper, and is off to his store. This same dog has other ways of his own, which are often amusing, though occasionally a little troublesome. Like his biped associates in this world of bustle and hurry, he requires to be waited on with the least possible delay; and if he is not attended to, he is quite likely to help himself, often making reprisals on us for our inattention, by taken from the pile of papers a mouthful, perhaps half a dozen. He seems to have very imperfect ideas of the distinction between *meum* and *tuum*—as much so as any person on 'Change. If, therefore, on coming to our counter, he finds it bare of papers, he casts an imploring look around the room, and if a luckless boy loiters with a paper in his hand, to watch the movements of the sagacious animal, the dog will seize the coveted paper, and be off before the astonished boy has time to rescue his stolen property. We are often reminded by the movements of this intelligent quadruped of the favourite saying of a certain queer old fellow:—"There is a great deal of human nature in beasts."

There are innumerable anecdotes illustrative of the intelligence of the Newfoundland, which, when full grown, and of pure breed, should measure upwards of six feet from the point of the nose to the tip of the tail. This may seem an extraordinary length; but the beautiful proportions of this animal, with the general upward curve, or bend of the tail, has an apparent effect in lessening this measure. Over the shoulders, from one fore foot to the other, the measurement is upwards of five feet and a half; round the head, and across the ears, about two feet; the length of the head, about fourteen inches; and the upper part of the leg, about ten inches. This is the measure of an animal when full grown and in his prime. His body is covered with long curly hair; his legs are also well-clothed; and his tail, likewise, is abundantly covered.

According to Mr. Richardson, the Newfoundland is of comparatively recent introduction to this country. "From the great share of emulation which nature has given him," says that gentleman, "to be surpassed, or overcome, would occasion great pain. On every emergency he is active, the friend of all, and is naturally without the least disposition to quarrel with other animals. He seldom, or ever offers offence, but will not receive an insult or injury with impunity. Such is the capacity of his understanding, that he can be taught almost anything that man can inculcate, of which his own strength and frame are capable. His sagacity can only be exceeded by his energies, and he perseveres with unabated ardour in whatever manner he is employed. While he has a hope of success, he will never slacken in his efforts to attain it. The amazing pliability of his temper peculiarly fits him for man's use; and he never shrinks from any service which may be required of him, but undertakes it with an ardour proportional to the difficulty of its execution. He takes a singular pride in being employed, and will carry a bundle, stick, or basket, in his mouth, for miles, and to deprive him of either of these is more than a stranger could, with safety, accomplish. Sagacity, and a peculiarly faithful attachment to the human species, are characteristics inseparable from this dog, and hence he is ever on the alert to ward off impending danger from his master, and to free him from every peril to which he may be exposed. From the astonishing degree of courage with which he is endowed, he is ever ready to resent an insult, or to defend his friend, even at the hazard of his own life. Inclined habitually to industrious employment, such dogs are as useful to the settlers of the coast, from which they are brought, as our galloways and ponies are to us. It is easy to accustom them to daily labour. From three to five of them are harnessed to a sledge, or other vehicle, containing a load of wood, or lumber, amounting to twenty or thirty stones, which they will draw very steadily for miles,

with ease, and will do this without the aid of a driver, when acquainted with the road; and having delivered their burden, they return home to their masters, and receive, as a reward for their labour, their accustomed food, which generally consists of dried fish, of which they are said to be extremely fond."

THE LABRADOR DOG.

This is an animal considerably larger than the Newfoundland, with a shorter muzzle, a more pendulous upper lip, a coarser coat, and altogether exhibiting marks of greater athletic power than are presented in the form of the Newfoundland. He stands from twenty-eight to thirty inches high.

The following are the measurements of a dog of this breed, given in *Knight's Weekly Volume*:—"Total length, including the tail, six feet three inches; height at the shoulder, two feet six inches; length of head, from occiput to point of nose, eleven inches; circumference of chest, three feet one inch. In Labrador, these large dogs are used in drawing sledges, loaded with wood, and are of great service to the settlers."

A fine specimen of this dog belonged to Lady Bellew, of Barmeath. It stood about twenty-nine inches high at the shoulder. This animal, although used for purposes of draught in his native country, might be applied to hunting purposes, as his scent is very keen.

THE LABRADOR SPANIEL.

In point of size, this dog stands between the Newfoundland and the land-spaniel. It is remarkable for its aquatic predilections, and, as a diver, is unrivalled. In reference to this animal, Mr. Richardson gives the following anecdote, on the authority of *Saunders's News-Letter*, a Dublin newspaper, where it appeared on the 1st of September, 1846. If true, it places the sagacity and disposition of this kind of dog, in a very favourable light:—

"*Peeler, the Dog of the Police.*—During a recent investigation relative to the manner in which the policeman came by his death at Kingstown, a little active and inquisitive dog, of the Labrador breed, was seen, from time to time, during each day, running in and out of the room, as if he took a personal interest in the inquiry. The dog was admired, and a gentleman in the police establishment was asked to whom it belonged. 'Oh,' said he, 'don't you know him? we thought every one knew Peeler, the dog of the police.' The gentleman then proceeded to give the interrogator the history of this singular dog. It appeared from the story, that, a few years ago, poor little Peeler tempted the canine appetite of a Mount St. Bernard, or Newfoundland dog, and was in peril of being swallowed up by him for a luncheon, when a policeman interposed, and, with a blow of his baton, levelled the assailant, and rescued the assailed. From that time Peeler has united his fortunes with those of the police; wherever they go, he follows; whether pacing with measured tread the tedious 'beat,' or engaged in the energetic duty of arresting a disturber of the public peace. He is a self-constituted general superintendent of the police, visiting station after station, and, after he has made his observation in one district, wending his way to the next. He is frequently seen to enter a third-class carriage at the Kingstown Railway, get out at Black Rock, visit the police station there, continue his tour of inspection to Booterstown, reach there in time for the train as before, and go on to Dublin to take a peep at the 'metropolitans;' and having satisfied himself that 'all is right,' return by an early evening train to Kingstown. He sometimes takes a dislike to an individual, and shuns him as anxiously as he wags his tail at the approach, and frisks about the feet of another, for whom he has a regard. There is one man in the force for whom he has this antipathy; and, a day or two ago, seeing him in 'the train,' he left the carriage, and waited for the next, preferring a delay of half an hour to such company; and when the bell rang, with the eagerness with which protracted joy is sought, he ran to his accustomed seat in 'the third class.' His partiality for the police is extraordinary; wherever he sees a man in the garb of a constable, he expresses his pleasure by walking near him, rubbing against, and dancing about him. Nor does he forget him in death; for he was at his post at the funeral of Daly, the policeman who was killed in Kingstown. He is able to recognise a few in plain clothes; but they must have been old friends of his. Wherever he goes, he gets a crust, a piece of

meat, a pat on the head, or a rub down upon his glossy back by the hand of a policeman; and he is as well known amongst the body as any one in it. We have heard of the dog of Montargis, the soldier's dog, the blind beggar's dog, and the dog of the monks of St. Bernard, and been delighted by stories of their fidelity and sagacity; but none are more interesting than 'Peeler, the dog of the police,' 'whose heart, enlarged with gratitude to one, grows bountiful to all.'"

THE CALABRIAN OR PYRENEAN WOLF-DOG.

This is the shepherd's dog of the Abruzzo, standing about twenty-nine or thirty inches high at the shoulder. He is usually of a white colour, with one or two patches of buff or tan on the head or sides; the ears are not hairy, and are half erect; the tail is bushy, and is carried in a curl, close over the back; the nose is pointed, and the general aspect of the head wolfish. They fill the position of the Scotch colley, or that of the English sheep-dog, to the Spanish and Italian shepherds, but are rather guardians than herders of the flocks. Their great value is to protect the sheep from the attacks of wolves and other ferocious animals.

THE POMERANIAN DOG.

This is a small dog, and usually of a white colour. It is not twenty inches high at the shoulder; its ears are perfectly erect, like those of a fox, with an unfringed tail, bushed all round like that of the fox. It is often called the "fox-dog," from its resemblance to that animal.

There is a small Chinese variety of dog, so closely resembling the Pomeranian (except in colour, being usually yellow or black), that they cannot be distinguished from one another.

"These are the dogs used as food by the natives. There are regular dog-butchers in most of the Chinese towns; and dog's flesh, especially roasted, is held in high esteem. It is not long since, that not only was 'roasted dog' regarded as the very quintessence of good living, but that, like 'living turtle' among us, its promised appearance at the board was regularly announced as an attraction to the invited guests."

THE HARE-INDIAN DOG.

This dog was first described by Dr. Richardson, and found by him on the Mackenzie river. It is of small size, and slenderly made, with broad, erect ears, sharp at the tips; the tail is pendent, with a slight curve upwards, near the tip. One which Dr. Richardson had was killed and eaten by one of his Indian guides, who stated that he mistook it for a fox. The feet of this animal are large, spread, and abundantly covered with fur, in consequence of which he can run upon the snow with rapidity and ease, without sinking. In their native country, these dogs never bark; in confinement they do.

THE ESQUIMAUX DOG.

This dog is as large as the Newfoundland, with long, coarse hair, and his tail curling over the back. Its ears are pointed and erect, and, in his general appearance, bears a strong resemblance to the wolf. He has a considerable share of intelligence and good temper. In his native country he is harnessed to the sledge, and generally performs the work of a draught animal. He is capable of undergoing great fatigue, and is both active and swift.

Besides this last dog of the north, there is the Siberian dog, a powerful animal; the Kamtschatka dog; the Iceland dog; the Greenland dog; and the Lapland dog; of which last, Mr. Clarke, in his work on Scandinavia, has given a description. He says—"We had a valuable companion in a dog, belonging to one of the boatmen. It was of the true Lapland breed, and in all respects similar to a wolf, excepting the tail, which was bushy and curled, like those of the Pomeranian race. This dog, swimming after the boat, if his master merely waved his hand, would cross the lake as often as he pleased, carrying half his body and the whole of his head and tail out of the water. Wherever he landed he scoured all the long grass by the side of the lake, in search of wild fowl, and came back to us, bringing wild ducks in his mouth to the boat; and then, having delivered his prey to his master, he would instantly set off again in search of more."

These animals are also employed in a similar capacity to that in which our Drover's dog is employed. They herd the reindeer. A gentle-

man who visited a Lap encampment, thus writes:—

"While I sojourned on the Island of Tromso, learning that on the neighbouring mainland some Laplanders were encamped, I resolved to pay them a visit Procuring a boat, I rowed over to the opposite shore, where I met with a Nordlander, who informed me that the Lap encampment might be found somewhere toward the extremity of Tromsdal—a magnificent ravine commencing at no great distance from the shore, and running directly inland. He stated that the Laps had a noble herd of *reins* (the name universally given to reindeer), about eight hundred in number, and that, when the wind blew from a certain quarter, the whole herd would occasionally wander close to his house, but a *rein-hund* (reindeer-dog) was kept by him to drive them back. * * * * *

"Onward we went, driving the herd, in which I gleefully helped, the three little dogs at times barking and fetching up stragglers. The Laps occasionally gave a short cry or urging shout to the reins, and I burst forth with my full-lunged English hallo, to the evident amusement of my companions. The scene was most exciting. The brilliant sunlight, the green grass, the sparkling, murmuring Elv, the picturesque glen, the figures of the Laps, the moving herd of reins—the novelty of the whole was indescribably delightful. I found the reins did *not* make such a 'clicking' noise as most travellers have asserted. Here were hundreds of reins striking their hoofs together, and yet the noise was certainly anything but loud from their cloven feet and horny fetlocks, and would hardly have been noticeable had I not particularly listened for it. But another thing, of which I had never read any notice, struck me much—the loud, snorting noise emitted by the deer at every step. Unpoetical as my fancy may seem, it reminded me most strongly of the grunting of swine, but was certainly not so coarse a noise, and, at the same time, partook much of the nature of a *snort*. The cause of the noise is this: when the deer are heated, they do not throw off their heat in sweat—their skin is too thick for that; but, like the dog, they emit the heat through the mouth. The size of some of the reins astonished me. In many instances they were as large as Shetland ponies, and some had most magnificent branching antlers of a very remarkable size. This is the only animal of the deer genus which invariably has a horizontal branch from the main antlers, projecting in a line over each eye. These antlers are covered with a short grey hair. Some of the herd in question had broken pieces off their antlers, which hung down, bleeding, by the skin. The does also have antlers, but very small, and generally straight, which, when skinned and dried, can be distinguished from those of the male by their whiteness. All the herd were casting their winter hair, and consequently their coats looked rather ragged and parti-coloured—the new colour being generally a dark, and the old a light grey. In some cases, however, the deer are white; and, in winter, all are more or less of a light colour. There were many pretty young does running among the herd."

THE GREAT ROUGH WATER-DOG.

This dog has a long and curled coat; a large and round head; well covered ears; somewhat short legs; and is generally of a black, black-and-white, or brown colour. His sagacity is considerable, and he has sufficient courage to attempt anything when backed by his master. The water is his element. Here he delights to move in; and when swimming, he seems rather to float, and make his way without either motion or exertion of the limbs. He is capable of being made a good retriever, but his training would require to be conducted with great care, as he is apt to mangle his bird, from the severity with which he uses his teeth.

The water-dog is a very different animal from either the German or French poodle, and has an originality of his own. Regarding this dog, Mr. Richardson gives the following anecdote:—"I recollect a singularly large dog of this breed, about ten years ago, in possession of Mr. Grierson, of North Hanover-street, Edinburgh, near the foot of the Mound, which was possessed of unusual intelligence. Amongst other eccentricities, this dog followed the profession of mendicancy, and regularly solicited the charity of the passers-by. On receiving a halfpenny, his habit was, if hungry, to proceed at once to the shop of Mr. Nelson, at the corner of Rose-street, and purchase a biscuit; but it sometimes happened that he put by his halfpence until the calls of appetite

returned; and he would go to his repository, take the money to the baker's, and make his purchase. A servant of Mr. Grierson's accidentally came upon this sagacious and provident animal's hoarding-place on one occasion, where were found about fivepence-halfpenny in halfpence. The dog chanced to enter at the moment of the discovery, and with a growl of displeasure he rushed to the spot, and snatching up his wealth, proceeded at full speed to the shop, and dashed the money on the counter, barking vehemently at the same time, probably deeming it safer to turn it into bread at once than risk being robbed by keeping it."

THE POODLE

Has a coat of wool rather than of hair, and bears a strong resemblance to the great water-dog, of the habits of which he partakes, in reference to his partiality for the element from which the other derives his distinction. This animal is as remarkable for his sagacity as many more of the race to which he belongs. He is extremely useful to persons engaged in the pursuit of water-fowl. He swims well, is very hardy, and is an excellent retriever. The French poodle may be referred to the spaniels. He appears to be very nearly allied to the rough water-dog figured by Bewick; the "grand barbet" of Buffon, of which there is a smaller variety, termed "*le petit barbet*."

In a paper, entitled "Sketches of Burschen Life," published in *The Dublin University Magazine*, appears the following ludicrous anecdote of a poodle and a short-sighted professor:—

"There was a story, when we were in Heidelberg, going about, of a certain student who had a remarkably fine white poodle; the intelligence and sagacity of the animal were uncommon; and, as he used daily to accompany his master to the lecture-room of a professor, who was not very remarkable for the distinctness of his vision, he would regularly take his seat upon the bench beside his master, and peer into his book, as if he understood every word of it.

"One wet morning, the lecture-room, never at any time remarkable for its fulness, was deserted, save by the student who owned the poodle. The dog, however, had somehow happened to remain at home.

"'Gentlemen,' said the short-sighted professor, as he commenced his lecture, 'I am sorry to notice that the very attentive student in the white coat, whose industry I have not failed to observe, is, contrary to his usual custom, absent to-day!'"

THE LITTLE BARBET.

This is nothing more than a smaller variety of the poodle, the head being covered with straight and silky hair—the rest of the body having a curly and woolly coat.

THE SILKY DOG—*CHIEN DE SOIE.*

Like a very small poodle, but covered with a long and silky coat. It is a great favourite with the French females.

THE LION DOG

Has a mane like a lion, the rest of the body being covered with short hair. It is supposed to have sprung from a cross between the small barbet and naked Turk. It is of no use as a dog, but interesting as a variety of the species to which he belongs.

CHAPTER VII.

MASTIFFS

We now enter upon a group of dogs distinguished by the shortness of the muzzle and the breadth of the head; this latter character resulting, not from a corresponding development of the brain, but from the magnitude of the temporal muscles, which are attached to a

bony ridge passing down the median line of the skull. The expression of the eyes is lowering and ferocious; the jaws are very strong; the lips pendulous; the general form is thick-set and robust; and the limbs are muscular.

This group comprehends the mastiff, the bulldog, and their allies. In sagacity and intelligence these dogs are not to be compared to the Newfoundland, the spaniel, or the shepherd's dog. They surpass all, however, in determined courage and prowess in combat.

THE BRITISH MASTIFF.

This is the *dogue* of Buffon, who considers it an offset from the bulldog; but this opinion, in the judgment of Mr. Blaine, is erroneous. In early times the English mastiff was celebrated for his strength and resolution, characteristics which did not fail to attract the attention of the Romans when this island formed a part of their widely-spread empire. To a people in whom a partiality for scenes of bloodshed and slaughter, and in whom the sanguinary games of the amphitheatre was a ruling passion, dogs so fitted to gratify their taste were peculiarly acceptable; and accordingly we find that they were bred and reared by officers specially appointed, who selected such as were distinguished for combative qualities, and sent them to Rome for the service of the amphitheatres, where they were matched in fight with various beasts of prey. Dr. Caius, a naturalist of the time of Elizabeth, states that three were reckoned a match for a bear, and four for a lion.

Though the mastiff has by no means the keen sense of smell which the hound possesses, he seems to be either an offset from that branch, or a cognate branch from the same root. The mastiff, however, has a finer scent than persons are generally aware of, and his hearing is very acute. A dog of this breed, chained to his kennel, and never suffered to wander about the premises, nor treated as a friend and companion, affords but a poor example of what the animal really is. Confinement spoils his temper, and cramps the development of his better qualities.

The mastiff has a very wide geographical distribution; and wherever he is found he presents nearly a similarity of outline in his make, and evinces the same qualities whether in Sweden, the Alps, Poland, Spain, Italy, or the Levant. As he approaches warmer climates, however, his strength degenerates. He becomes more slender, and rather resembles the old Spanish pointer than the full-bodied European animal. This dog is considered by Grotius as one of the *indigenal* of Britain; but in this he has not been satisfactorily corroborated.

Mr. Richardson attributes his origin to a mixture of the bulldog of ancient Britain with the old Talbot hound, and gives us the following characteristic anecdotes:—

"The disposition of the mastiff is characterised by courage, generosity, and forbearance: even the midnight marauder will be held by him uninjured until human aid arrives, provided he refrain from struggle or resistance. The attacks of puny antagonists are despised; but if they become intolerable, the noble mastiff is satisfied with showing his contempt, or inflicting chastisement of rather a humiliating than a painful nature. The story of the mastiff which, when greatly annoyed by the incessant barking of a little cur, took him by the back of the neck, and dropped him over a quay wall into the river, is well known; but I recollect an instance of this nature, when the mastiff, standing for a moment contemplating the struggles of his late tormentor, and perceiving that the current was likely to carry him away, actually sprang into the water, and rescued him from his dangerous position."

Henry VII. ordered a mastiff to be hanged, because he had *singly coped with and overcome a lion!* And in the reign of Queen Elizabeth, when Lord Buckhurst was ambassador at the court of Charles IX., a mastiff is said, alone and unassisted, to have successively engaged a bear, a leopard, and a lion, and pulled them all down. Stow relates an engagement which took place, in the reign of James I., between three mastiffs and a lion. One of the dogs being put into the den, was soon disabled by the lion, which took him by the head and neck, and dragged him about. Another dog was next let loose, which shared the same fate; but the third, on being put in, immediately seized the lion, and subdued him.

THE CUBAN MASTIFF.

We have said that the mastiff is allied to the hound: the Cuban mastiff, is, indeed, often

termed a bloodhound. The pendulous ear, not so large in the mastiff as in the hound; the thick hanging lips, the broad moist nose, brindle markings, and the general figure, attest the affinity. The mastiff is larger and stronger than the hound, and useless for the chase; this latter circumstance, however, is no proof of diversity of origin. It must be remembered that particular instincts and qualities are acquired, and that the excellences of the hound are the result of long-continued and judicious culture. We do not say that the mastiff can be converted into the hound, but merely that two branches from the same root may be so cultured as to assume, to a given point, diverse characteristics. This animal is by no means to be confounded with the Cuban bloodhound. He is quite a different dog. Nor is the Cuban bloodhound and the British bloodhound the same, although Sommerville seems to have thought them identical.

"Soon the sagacious brute, his curling tail
Flourish'd in air, low-bending, plies around
His busy nose, the steaming vapour snuffs
Inquisitive, nor leaves one turf untried
Till conscious of the recent stains, his heart
Beats quick; his snuffing nose, his active tail,
Attests his joy; then, with deep-opening mouth,
That makes the welkin tremble, he proclaims
The audacious felon; foot by foot he marks
His winding ways, while all the listening crowd
Applaud his reas'nings. O'er the wat'ry ford,
Dry, sandy heaths, and stony barren hills;
O'er beaten paths, with men and beasts disdained,
Unerring he pursues, till at the cot
Arrived, and seizing by his guilty throat
The caitiff vile, redeems the captive prey."

"The Spanish or Cuban mastiff," Mr. Richardson says, "is a very powerfully-built dog, and is supposed to be a breed between the mastiff and the pointer. He stands from twenty-six to twenty-eight inches high, with extraordinary development of bone and muscle. His head is of prodigious size, even apparently too large in proportion to his body: his eyes are placed very far apart; his upper lip pendulous, but not so much so as in the British mastiff; the ear is small, and not perfectly pendulous, being erect at the root, but the tip falling over; colour usually tawny or light rufus; the under jaw is also *undershot*: and I do not think I can give my readers a better idea of the dog, than by describing him as a gigantic bulldog, occupying precisely the same position with regard to the prodigious mastiff of the Alps, which our own British bulldog does in reference to the English mastiff." This animal is a dog of great courage; in Spain he is used in the combats of the amphitheatre, and is commonly known on the continent as the "Spanish bulldog." Colonel H. Smith conceives this race to have been identical with the broad-mouthed dogs for which Britain was celebrated during the Roman era.

THE DOG OF TIBET.

The huge Tibet watch-dog belongs to the present group. This dog (*Canis familiaris*, var. *Molosus Thibetanus*) is kept by the natives of the Tibet range of hills as a guardian of their flocks and their villages. It is very fierce, and its bark is loud and terrific. The colour is generally black.

His head is large and broad. His lips are very full and pendulous; and the skin, from the eyebrows, forms a fold towards the outer edge of the eyes, ending in the jowl; the neck is remarkably full, and the chest is furnished with a *dewlap*. This species was originally noticed by Marco Polo, who described them as being "as large as asses," a description contradicted by some subsequent travellers, but since amply confirmed.

The probable cause of these varying accounts is, that the Tibet mastiff rapidly degenerates if removed to a milder climate; and several inferior, though similar breeds, exist in different portions of the Himalayan chain of mountains. Colonel Smith refers to this dog as the typical mastiff—the *Canis Urcanus* described by Oppian.

THE DOG OF ST. BERNARD, OR ALPINE MASTIFF.

This dog is placed under the spaniel group by Mr. Blaine, and Mr. Richardson classes it with the mastiffs. We have adhered to the arrangement of the latter.

Colonel Smith classes it with the wolf-dog group. He, however, says that more than one description of dog is trained by the monks of the Great St. Bernard, with the view of rescuing the unfortunate from the horrors of death amid the dreary depths of Alpine snows. One sort he describes as having a long coat, with

the appearence of the Newfoundland; and the other as having a short one, and bearing a resemblance to the great Dane, both in the character of its hair and the colour.

Referring to the origin of the pious act of the monks of St. Bernard, in having dogs trained to the humane purpose of saving human life, Mr. Richardson says, that "the dog originally trained to this service was a large and powerful mastiff, short-coated, deep-jowled, of a yellow colour, with a long, fine tail. L'Ami, who was brought, in 1829, from the convent on the Great St. Bernard, was of this description. He was exhibited in both London and Liverpool to many thousands of people, at the charge of one shilling admission. I was favoured by Mr Clark, of Holborn, with a full account of the true dogs of St. Bernard, obtained by him from the very best authorities. A good many years ago, a pestilence made its appearance amongst the dogs of the convent, and all were destroyed save one single specimen. Under these circumstances, the monks had no alternative but to cross the breed, which they did with the Spanish or Pyrenean wolf-dog—the most likely cross to which they could have resorted; hence arose the race of dogs ordinarily known as St. Bernards. Some of the true race have now been restored; but they are very scarce, and are not to be possessed under enormous prices; in fact, not to be had from the convent at all; Mr. Clark being acquainted with a nobleman who offered one hundred guineas for a brace of puppies, without success. Hence the mistakes arising from spurious dogs, supposed to be original, merely because they came from the mountain.

* * *

In Dublin these dogs used to be common. They were introduced by a Frenchman, named Casserane, in Ormond Market. He had a male and female, and their whelps were eagerly purchased at five guineas each, as soon as weaned. W. Flood, Esq., of Stillorgan, possessed a noble specimen; and there was, also, a beautiful specimen, named 'Donna,' in the possession of John Richardson, Esq., of Newington Terrace, Rathmines. Donna was celebrated as a water-dog. She was gentle, but very wild and playful, and her tremendous size rendered her romping caresses anything but agreeable. Mr. Richardson went, on one occasion, to bathe, accompanied by Donna, who watched the progress of unrobing with much apparent curiosity. No sooner had her master plunged into the water, however, than she sprang after him, and, doubtless uneasy for his safety, seized him by the shoulder, and dragged him, in spite of all his resistance—and he is both a powerful man and a capital swimmer—with more zeal than gentleness, to land; nor could he ever enter the water in Donna's presence."

THE BRITISH BULLDOG.

Of all the dogs of this group, none surpass in obstinacy or ferocity the bulldog. This animal is smaller than the mastiff, but more compactly formed; the chest is broad and deep; the loins narrow; the tail slender and arched up; the limbs short and robust; the head is broad and thick; the muzzle short and deep; the jaws strong, the lower jaw often advancing, so that the inferior incisor teeth overshoot the upper; the ears are short and semi-erect; the nostrils distended; the eyes scowling; and the whole expression calculated to inspire terror. This dog is distinguished by tenacity of tooth, and indomitable resolution. In all his habits and propensities he is essentially gladiatorial: he is a fighting dog, and nothing else. His intelligence is very limited; and though dogs of this breed are attached to their masters, they exhibit in the demonstration of their feelings, unless when incited to combat, a perfect contrast to the Newfoundland dog or spaniel. These latter delight to accompany their master in his walks, and scour the fields and lanes in the exuberance of delight; the bulldog skulks at his master's heels, and regards, with a suspicious glance, everything and everybody that passes by; nor, indeed, is it safe to approach the animal, for he often attacks without the slightest provocation. A cross between the bulldog and the terrier is celebrated for spirit and determination.

"The British bulldog," says Mr. Richardson, "is, when a good dog, perhaps one of the most courageous animals in existence. I am obliged to qualify my meed of praise, however, as I have myself seen bulldogs, not merely of very doubtful courage, but absolutely *cowards*. I attribute this moral degeneracy to the prac-

tice of too close, or *in-and-in* breeding—a practice certain to prejudice the mental qualifications, even though external or physical conformation remain apparently the same."

The bulldog needs little description: he usually stands twenty inches in height—if smaller, he is so much the more highly esteemed—his head is large and round; his eyes small, and far apart; ears small, and partly erect; muzzle short, truncated, and turned upwards; under jaw projecting beyond the upper, displaying the lower incisor teeth; colour usually brindled, but white is the fancy colour; party colours, as black-and-white, &c., are to be condemned; his tail must be fine as a rush.

The bulldog is not wholly destitute of good qualities, as some writers have represented him to be. Besides his courage, he possesses strong attachment to his master. Mr. Jesse relates an anecdote of a bulldog which, having been accustomed to be his master's travelling companion in his carriage for several years, on his place being allotted to a new favourite, refused to eat, sickened, pined, and died.

THE PUG-DOG.

It has been usual to consider the pug-dog as a degenerate variety of the bulldog, but the correctness of this theory has been doubted. It has, indeed, somewhat the aspect of the bulldog, on a miniature scale; but the similarity is more superficial than real. The pug is a little round-headed, short-nosed dog, with a preternatural abbreviation of the muzzle, and with a tightly-twisted tail. Like the Gillaroo trout, it is a specimen of hereditary malformation. Not so the bulldog, in which the bones of the skull and the temporal muscles are finely developed, and in which the muzzle and head are in perfect harmony.

The pug-dog is snarling and ill-tempered, but cowardly, and by no means remarkable for intelligence. Formerly it was in great esteem as a pet, but is now little valued, and not often kept.

THE BAN-DOG.

The Ban-dog is a term applied to any of the fierce animals of which we have just been treating, and which are, in ordinary cases, kept chained or secured in kennels. Bewick, however, applies it to a dog, of which he gives an excellent figure, and which, he states, differs from the mastiff in being lighter, more active and vigilant, but not so powerful or so large; his muzzle, besides, is not so heavy, and he possesses, in some degree, the scent of the hound. His hair is described as being rather rough, and generally of a yellowish grey, streaked with shades of black or brown. He is ferocious and full of energy. Bewick says that this dog is seldom to be seen at the present day. Varieties, however, of the mastiff have been noticed, agreeing so closely with Bewick's figure and description, as to convince some that both of them were taken from nature.

In taking a review of the various breeds of the domestic dog, it must be observed, that they are endowed respectively with qualifications or habits certainly not innate, but the result of education, at least originally; which education, continued through a series of generations, has produced permanent effects. For example, no dog in a state of nature would point with his nose at a partridge, and then stand like a statue, motionless; for he would gain nothing by such a proceeding. Man, however, has availed himself of the docility and delicacy of scent peculiar to a certain breed, and has taught the dog his lesson; and the lesson thus learned has become second nature. A young pointer takes to its work as if by intuition, and scarcely requires discipline. Hence, therefore, must we conclude that education not only produces impressions on the sensorium, but transmissible impressions, whence arise the predispositions of certain races. Education, in fact, modifies organisation: not that it makes a dog otherwise than a dog, but it supersedes, to a certain point, instinct, or makes acquired propensities instinctive, hereditary, and, therefore, characteristics of the race. The effect of this change of nature is not to render the dog more independent, nor to give it any advantage over its fellows, but to rivet more firmly the links of its subjection to man.

It is not to the pointer alone that these observations apply. All our domestic dogs have their own acquired propensities, which, becoming second nature, make them, in one

way or another, valuable servants. No one, we presume, will suppose that the instinctive propensities implanted by nature in the shepherd's Colley, could make it, not a destroyer, but a preserver of sheep. On the contrary, this dog, like every other, is carnivorous, and nature intends it to destroy and devour. But education has supplanted instinct, to a certain point, and implanted a disposition which has become an hereditary characteristic, and hence a Colley of the true breed takes to its duties naturally. But a shepherd's dog could not, delicate as its sense of smell is, be brought to take the place of the pointer in the field, even though it were subjected to training from the earliest age; nor, on the other hand, could a pointer be substituted with equal advantage for a shepherd's dog, as the assistant of the drover. Each is civilised, but in a different style; and education has impressed upon each a different bent of mind, and a different class of propensities.

CHAPTER VIII.

DISEASES OF THE DOG.

THE diseases to which dogs are subject are numerous, and their treatment various. In the highly artificial state in which they are forced to exist, in order to serve the purposes of man, they require the utmost attention, especially such as are kept to assist in the sports of the field and the forest. These, like the race-horse and the hunter, require what is technically called "conditioning" before they are fit for use. Colonel Cook observes, that he lost three of his best dogs, wholly by inattention to their state in this particular, which caused him afterwards to pay double attention to that most material point—*condition*. "A dog, to be in condition, should be neither too fat nor too thin. His ribs should be visible, and the flanks moderately hollow; but the loins must be well filled up in a dog in perfect condition. When dogs exhibit general fulness and too much flesh," observes Colonel Cook, "commence by physic and a regular course of exercise, which should be mild at first, but increased until it is severe. Avoid too great a privation of food, otherwise the conditioning process will be retarded." As a general rule, hounds, greyhounds, pointers, setters, spaniels, and all sporting dogs, require to be put into a proper state for their work. They must be *conditioned*, by either lightening their bodies of flesh, or hardening that flesh to such a degree as to give firmness to its whole texture.

The physic necessary for this purpose is variously formed. "Julap," says Mr. Blaine, "is a favourite purge with some sportsmen; but it is uncertain in its action. Gamboge is very drastic. The submuriate of mercury (calomel) is likewise very irregular in its action on dogs. We have known eight grains fail to open the bowels of even a small one; while, on the contrary, we have, ourselves, seen a pointer totally poisoned by ten grains. It forms, however, a useful auxiliary to purgatives in doses of three or four grains; and, as it not unfrequently acts upon the stomach, so it may be used with advantage as an emetic in some cases, particularly in conjunction with tartarised antimony (tartar emetic). When, therefore, a purgative is brought up again in which calomel was a component part, it may be suspected to arise from this source; and if it be necessary to repeat the purge, the mercury should be omitted. Epsom salts are used in some kennels; but they are bulky; and if attempted to be given in the food, are often refused. Syrup of buckthorn has long been a favourite purge with dog-fanciers. Mr. Beckford recommends it, but mixes with it sulphur and antimony, in the proportions of two pounds of sulphur, one pound of crude

antimony, and a pint and a-half of syrup of buckthorn, which answers for thirty couple of hounds. Aloes, in our opinion, form the best general purge for dogs; and such are the peculiarities of their bowels, that while a man can take, with impunity, as much calomel as would kill two large dogs, a moderate-sized dog will take a quantity of aloes sufficient to destroy two stout men. The smallest dog can take fifteen or twenty grains; half a drachm is seldom too much; but the smaller dose had better be tried first. Medium-sized dogs usually require a drachm; and some large dogs have taken more than two drachms. We have ourselves given three to a strong Newfoundland dog without extreme catharsis; but, as before observed, dogs differ much in their different habits, and it is, therefore, the most prudent plan to begin with a dose too small, than too large. Hundreds of dogs are, every year, destroyed by temerity in this particular."

The alterative medicines for dogs are buttermilk and whey, which are good for cutaneous affections. The nitrate of potash (nitre), in doses of from four to ten grains, for heat of the blood or redness of the skin. Cream of tartar may also be given in large doses in the same cases. As dogs are easily salivated, all the preparations of mercury should be very cautiously given. Sulphur affects dogs but slightly. Where, however, there are diseases of the skin, it may be given in combination with a moderate quantity of cream of tartar.

Emetics have been questioned as good remedies in dog diseases. The best, in cases of distemper, is tartarised antimony, which may be given in milk or soup, or as a ball, rolled up in a piece of meat or butter. The quantity must be proportioned to the size and strength of the dog; from one grain, as the smallest, to five as the largest dose. As a cleansing emetic, calomel, of from four to six or eight grains, is good.

RABIES, OR CANINE MADNESS.

Hydrophobia—a term expressing *fear of water*—is, when used to mark this malady in the dog, quite incorrect; for a dog labouring under rabies will drink water, not only willingly, but greedily, to the very last. Where rabies exists, dogs *never have fits*. A knowledge of this fact may be the means of saving the life of many a poor animal.

"One of the earliest symptoms of rabies in a dog," says Mr. Richardson, "is *restlessness*. He is constantly turning round and round before he will lie down; his countenance becomes anxious; his eyes bloodshot; he fancies that he sees objects around him which have no real existence, and he snaps at the empty air; his fondness for his master increases, and with it his propensity to lick the hands and face—a filthy practice at any time, and one most dangerous; for the virus generated under the influence of rabies is deposited on the surface, and acts as if the person had been inoculated by it. Children should never be suffered to indulge dogs in this filthy habit. In a state of confirmed rabies, the appetite becomes depraved; his natural food is neglected, and, at the same time, every sort of filthy trash is greedily devoured. Eating his own excrement is an early symptom, and so sure a one, that the moment a dog is seen doing so, he should be destroyed, or, at all events, carefully confined.

"Rubbing the paws against the sides of the mouth. If this be done to remove a *bone*, the mouth will remain open; but when it takes place as the precursor of rabies, the jaws close after the rubbing ceases.

"Soon follows an *insatiable thirst;* so insatiable that the poor animal often plunges his whole muzzle into the water; and here you may observe *spume* left upon the surface. Soon the dog falls, or staggers, and sometimes, but not invariably, becomes delirious. Death speedily ensues under these symptoms."

The origin of this terrific disease is, by the most experienced veterinarians, assigned to inoculation; but the first animal that indicated its symptoms must have generated it spontaneously. It was long supposed that heat was a prolific cause; but this has been proved not to be the case. The disease is hardly known on the continent of South America: it is entirely unknown in Egypt; and Syria has never been visited by it. Neither is extreme cold favourable to its generation, for it has never made its appearance in Greenland. M. Audry, a French writer on this subject, says, that January, the coldest, and August, the hottest month, furnish the fewest instances

of rabies. The quality and quantity of food has been assigned as a cause; but in dogs which, by chance, have been placed in situations where it was impossible for them to obtain food, though on the precincts of actual starvation, the disease has never yet been discovered. Experiments innumerable have been made to discover the real origin of this disease, which, in various years, has proved itself to be nothing less than a scourge in different European countries. Spain, Germany, France, and England have all been visited by its ravages; and there is, perhaps, no pain, no disaster, no disease, so terrifying to the human mind, as that which is supposed to succeed the bite of a rabid dog. Amongst other experiments, made with the view of tracing the origin of canine madness, one performed at the veterinary school of Alport is, perhaps, the most striking:—Three dogs were chained and placed in such a situation that the heat of the sun might fall, with all its power, upon them. To one nothing was given but water; to another nothing but salted meat; and to another neither food nor drink was allowed. The whole three died; but not one of them exhibited the slightest symptoms of rabies; which we take to be a strong argument in favour of its being generated only by inoculation. Repletion has never caused it; feeding on putrid meat does not cause it; nor does the want of water. Its real origin, therefore, must be supposed a kind of puzzle, which all experience has yet been unable to solve to the entire satisfaction of those who have been the most active in experimenting upon it.

Considering the fearful consequences which frequently result to those who have had the misfortune to be bitten by rabid dogs, the symptoms of the disease cannot be too clearly explained, or too widely disseminated. Both Mr. Youatt and Mr. Blaine have given much attention to this subject; and both had much experience in its treatment, in the canine as well as in the human species. It is a common belief that dogs have a horror of water when affected by the disease; but this is by no means the case. "A mad dog," says John Hunter, "can swallow solids and liquids through the whole disease." "A rabid dog," says Dr. Hamilton, "never avoids water, and laps whatever liquid food is set before him, long after the poison can be communicated by his bite;" and Mr. Meynell says, "that mad dogs will even lap it the day before they die from the effects of the disease." The most eminent veterinarians concur in these opinions—a circumstance which we hope will have the effect of completely eradicating from the minds of all those who peruse this book, the baleful prejudice that dogs, when labouring under an affection of rabies, will not drink water. Of the danger of entertaining a prejudice of this kind, Mr. Blaine produces a striking example. An eminent physician having been consulted on the propriety of employing some prophylactic means, in consequence of three persons of the family of a well-known horse-dealer having been bitten by a dog under disease, satisfied himself with inquiring whether the animal could drink while under the complaint? Being informed that he did so, freely, throughout the whole of its duration, he unhesitatingly declared that no precautionary means whatever were necessary, and that he would, therefore, suggest none. Fortunately, the bitten parts of each of these persons were, notwithstanding, excised at the suggestion of Mr. Blaine, and the result proved the correctness of his judgment in the performing of such an operation; as a horse and dog, both known to have been bitten by the dog alluded to, died rabid in three weeks afterwards.

We have given the symptoms of rabies, as described by Mr. Richardson; and we will now give those, as described by Mr. Blaine, whose extensive practice and experience of this disease, place him in the very highest position as a safe guide and authority. Before closing this subject, we would entreat all our readers who keep a dog or dogs, whether as domestic pets, watchers, coursers, hunters, or for any other purpose not implied by these terms, to have, at all times, a vigilant eye upon the condition of their animals. "The symptoms of madness are very variable; but, as the early ones are not very active, they are apt to be overlooked in sporting dogs; and it is only in such as are kept immediately about our persons, and within doors, that they show themselves. In these cases of close domestication, the approach may be observed by some slight alteration of manner and habit. In some its approaches are marked by unusual dullness; in others by increased vivacity, accompanied with restlessness or

earnest attention to slight noises and minute objects. In one instance we foretold the approach of the disease by the uncommon attachment of a puppy to a kitten, which he was continually licking, as well as the cold nose of another pug that was with him. Deane, Earl Fitzwilliam's huntsman, has observed that, among hounds, he regarded the smelling and licking of the penis and fundament of another dog, as a most suspicious symptom. It is a curious circumstance that sexual excitement is frequently an early symptom in all the subjects of rabies; in dogs it is common; it has been remarked in the human species also. Sheep and pigs becoming rabid, are usually observed to show the disease first by riding their fellows. Lapping their own urine is a very common precursor to more active symptoms in the rabid dog. The eyes, even in the early stage of the disease, are often singularly bright, sparkling, and red; occasionally a slight tendency to distorted vision, or squinting, is apparent; and such alterations in the usual appearance of the eyes, are generally followed by mischievous propensities in the animal. Nevertheless, in some less frequent cases, the eyes are even less bright than natural, and a slight discharge of mucus, and sometimes of real pus or matter, escapes from their inner corners, and now and then flows from the nose also, which has frequently occasioned madness to be mistaken for distemper. But we would impress on the reader, that a moderate attention only to the manner of the dog and to the morbid symptoms here laid down, will enable any one readily to distinguish between these diseases, provided the observer does not allow himself to be swayed by prejudice or foolish counsel. In some instances, an early rabid symptom is a continual licking, scratching, and sometimes even biting of some part of the dog's own body; and this very part is often proved to be that by which the infection was received; and we believe, if a true history of every attack could be obtained, this would turn out to be the case in nine out of ten cases. Costiveness is very common; and vomiting also, although much less so, does occasionally occur; but ineffectual efforts to vomit are by no means unusual. The appetite is not always affected, in either early or continued rabies; on the contrary, food is not only eaten, but digested also, during the first stages; and some will eat almost to the last; but with such subjects the food is seldom digested. That no disinclination to liquid exists, will be readily acknowledged by all who observe the disease with common attention; from the first to the last, no aversion to water is observed. We state this as a general fact; one or two instances in as many thousands may occur of constitutional idiosyncrasy, where liquids are refused; and of the many hundred rabid dogs we have seen, not one has shown any dislike to water. In the early stages, liquids of all kinds are taken as usual, and some continue to take them throughout the complaint; nor can we press too strongly on the recollections of persons engaged about dogs, that no manifest dread of water is either a pathognomonic, or at all a usual symptom in mad dogs. Neither does an active spasm attend the efforts to swallow water; and however the paralysis of the parts may render the attempt ineffectual, the sight and contact occasion no pain whatever; but, on the contrary, the desire for drink is urgent, and unceasing attempts to take it, mark a majority of rabid cases; it is true that paralysis of the parts prevents deglutition in some, while others drink freely throughout the disease; but certainly there is not one in a thousand that does not seek water."

As this is a most important subject, we think it cannot be too fully treated; accordingly we have collected as many opinions as we have been able upon its different modes of treatment, as well as the different characteristics of the disease.—When a dog is affected with rabies, the symptoms are, in the first place, restlessness, turning round before he will lie down, blood-shot eyes, an anxious countenance, and a continual snapping at fancied objects. All these, in most cases, exhibit themselves some days before he gets very bad. A dog in a fit is generally taken suddenly, and merely knocks about and froths at the mouth. It is the opinion of most country people, that a dog affected with rabies is afraid of water; and if they see a dog drink, or go near water, they conclude he is not mad, no matter what they may have seen before; but we have seen a mad dog that followed a man through a stream, and when he got into it he

stopped to drink, and tried to find the man again when he got over. As a matter of course, it will be asked, how do we know the dog was really mad. And it would have been well if it had never been proved, as it cost the life of one fellow-creature, besides a great number of sheep, dogs, and some beasts. That the dog was mad, therefore, there could not be the smallest doubt, and yet he had no dread of water whatever.

The symptoms of rabies, however, deviate greatly in accordance with the different temperaments of dogs. Such as are subject to fits will be at one moment scouring the fields in apparently excellent condition, but all at once will make a dead stop, gaze intently and wildly at some fancied object, then suddenly fall into convulsions, from which (if a little water is dashed in the face) they will soon recover, and be as well next day as if nothing had happened.

With a rabid dog, however, it is quite different. There are always premonitory symptoms, the most prominent of which are a depraved appetite, the animal ravenously devouring its own, as well as human excrement, sticks, cinders, mud, and all kinds of filth, which, in a healthy state, it would avoid. In some breeds of spaniels, however, there have been exhibited exceptions to this rule.

The next important symptom, and one which may, perhaps, be considered as the most demonstrative, is an insatiable thirst, and an eager craving after its own and other dogs' urine, searching in every corner, and, wherever one dog has wetted, greedily licking it up. This disgusting act is never found in the healthy animal.

We think this symptom so decided a proof of rabies, that we should at once have the animal destroyed, however valuable it might be.

For a disease so terrible, no efforts should be spared to find out the means of either preventing or counteracting its effects. In accomplishing this, even the labours of science have, in a great measure, been unavailing; for a curative agent has, we believe, not yet been discovered.

The following singular account of the discovery of a supposed antidote, however, appeared some years ago in several continental newspapers, as an extract from the *Berlin State Gazette*. We give it as it appears in the small work of Mr. Richardson:—

In the year 1813, when Maraschetti, an operator in the Moscow hospital, was visiting the Ukraine, fifteen persons applied to him for relief on the same day, all having been bitten by a rabid dog. Whilst the surgeon was preparing such remedies as suggested themselves, a deputation of several old men waited upon him, with the request that he would permit a peasant, who had for some time enjoyed considerable reputation for his success in treating cases of hydrophobia, to take these patients under his care. The fame of this peasant, and his skill, were known to M. Maraschetti, and he acceded to the request of the deputation on certain conditions: in the first place, that he himself should be present, and made cognizant of the mode of treatment employed; secondly, that proof should be given him of the dog that had injured the sufferers being really rabid—and then that he, the surgeon, should select one of the patients to be treated by himself according to the ordinary course adopted by the medical profession. This might, at a hasty view, be deemed an improper tampering with human life on the part of the Russian surgeon; but, when the admitted hopelessness of all remedies is recollected, the reader will refrain from animadversion. M. Maraschetti selected, as his own patient, a little girl of six years old; the other condition was duly complied with: no doubt could exist of the genuine rabies of the dog, which perished shortly afterwards in extreme agony.

The peasant gave to his fourteen patients a decoction of the tops and blossoms of the broom plant (*Flor. Genistæ luteæ tinctoriæ*), in the quantities of about a pound and a-half daily; and twice a day he examined beneath their tongues, where, he stated, small *knots*, containing the virus, would form. Several of these knots did eventually appear, and, as soon as they did so, they were carefully opened and cauterised with a red-hot wire; after which the patients were made to rinse their mouths, and gargle with the decoction. The result was, that all the patients—two of whom only, and these the *last bitten*, did not show the knots—were dismissed, cured, at the expiration of six weeks, during which time they had con-

tinued to drink the decoction. The poor little girl, who had been treated according to the usual medical formula, was attacked with hydrophobic symptoms on the seventh day, and died within eight hours after the accession of the first paroxysm. M. Maraschetti saw, three years afterwards, the other fourteen persons all living, and in good health.

In 1818, five years after the above occurrences, M. Maraschetti had another opportunity afforded him, in Podolia, of testing the value of this important remedy, in the treatment of twenty-six persons, all of whom had been bitten by rabid dogs. Of these persons, nine were men, eleven were women, and six were children. He used the decoction of broom, as before; and a careful examination of their tongues gave the following results:—Five men, all the women, and three of the children, exhibited the *knots*—those most severely bitten on the third day, others on the fifth, seventh, and ninth; and one woman, who had been bitten only superficially on the leg, not until the twenty-first day. The remaining seven showed no *knots*, but all continued to drink the decoction; and in six weeks all the patients had recovered.

From these cases, M. Maraschetti was led to the opinion, that the rabid virus, after remaining a short time in the wound, becomes absorbed, and, for a certain time, resides beneath the tongue, at the orifices of the submaxillary glands, where it develops itself in the small *knots* observed by him. The average time for the appearance of these knots would appear to be from the third to the ninth day after the bite—that if not opened within twenty-four hours after the first formation, the virus is reabsorbed into the system, and the patient is lost beyond all hope of cure. On these accounts, Maraschetti recommended that the patient should be at once examined beneath the tongue, which examination should be continued for six weeks, during which period they should take one pound and a-half of the decoction of broom daily, or a drachm of the powder four times a day. If, during this time, no *knots* appear, there is nothing to be apprehended; but if they do appear, they should be freely opened and cauterised, using the gargle afterwards, as already described.

Since the above statement appeared in the *Berlin State Gazette*, an official report was made to the Prussian government, and published in a subsequent number of that paper, representing that *knots*, similar to those described by M. Maraschetti, had been formed beneath the tongue of a *rabid dog*, in Westphalia. It is possible that the above account may be familiar to most, if not all, medical readers, and that many of them may regard it as resulting from either imposture or error; but, as one and all of them admit that they *cannot* cure this dreadful disease, surely any suggestion is worth acting upon, if a melancholy opportunity should occur.

Instances of rabid dogs are numerous. One much attached to its owners, on one occasion returned home, covered with dirt, and hid itself in a blanket, and would not obey the commands of those it had hitherto been ready to serve by all the means in its power. Mr. Youatt, the veterinary surgeon, was sent for, and when he arrived he found the animal lying in the lap of its mistress, no doubt receiving all those endearments which such animals are so apt to draw from all those who are attached to them; but it kept continually changing its position, and starting at the least noise. Mr. Youatt pronounced it rabid. The dog had been licking the hands of its owner, and Mr. Youatt urged a surgeon to be immediately sent for. This was done, and the proprietors of the animal were saved.

The habit of allowing favourite dogs to lick not only the hands, but the face, as some do, is not only abominable in itself, but in the last degree dangerous, for there are comparatively few out of the multitudes who keep dogs, that have the slightest idea of the symptoms of rabies, even when they have made their appearance. A lady's spaniel was rarely out of her sight, and yet it became rabid. She did not know of its having been bitten by any other animal, and her servant denied all knowledge of its having been so; but the dog died; and, in a few weeks afterwards, the man was taken ill. He now made a confession that the spaniel had, on one occasion, been attacked and rolled in the mud by another dog, and that he had put it through a process of ablution before he permitted it to be seen by its mistress. The dog which had behaved so unceremoniously to

this pet spaniel, was mad, and some of the saliva which had fallen from its mouth, had remained on the coat of the spaniel, and by which the man had been inoculated.

Rabies, or hydrophobia, a few years ago exhibited itself to such a serious extent in Stainborough Park, near Barnsley, as to excite the alarm of the inhabitants of that locality, and to attract the attention of medical men. The disease first began to show itself on a small scale, immediately after a mad dog was said to have been roaming about the locality. Nearly one hundred deer in a short time fell victims to its effects. While in a state of disease, these otherwise innocent and playful animals foamed at the mouth, worried each other like dogs, and tore off each other's hair and flesh; and when placed in a state of confinement, bit at whatever came within their reach. Attention was drawn to the matter through a child belonging to one of the workmen on the estate having been bitten. This caused an alarm, which led to a medical gentleman (Mr. M. T. Sadler, of Barnsley) being called in. He issued a timely caution to the inhabitants, calling upon all to be on their guard, to protect themselves and their families from the infliction of so terrible a malady.

As canine madness suddenly changes the dog into an object of terror and a scourge, of course everything that may be esteemed a remedy for it should be tried. Among others already suggested, the "Berlin Drink" holds a prominent place. It was, and we believe still is, in the possession of a woman residing near Tunbridge. The recipe of it, it is said, is a secret, which has been handed down in the family from generation to generation; and its efficacy, in the counties around, is so well known and esteemed, that it has, at all times, proved a lucrative legacy to the family.

Among the numerous instances in which it is said to have been successful, we will adduce one which may excite some surprise.

The proprietor of a large pack of beagles had his kennel broken into by a rabid dog, and twenty of the pack bitten. He had known many cases successfully treated by the "Berlin Drink," and he determined to try its effect upon every one of his dogs that had been bitten. His brother, who had been brought up to the medical profession, laughed at the idea, maintained that nothing could save them if once the virus had entered the system, and proposed the total destruction of the whole pack. The other, however, opposed his experience to all the arguments of science. They therefore came to an arrangement which satisfied both parties. It was agreed that sixteen of the infected hounds should have a dose of the "Berlin Drink," and that the other four should take their chance.

The consequence was that, in less than six weeks, every one of the four died raging mad, and not one of the sixteen ever showed a symptom of the disease. As this fact has been pretty well authenticated, a more convincing proof of its power as an antidote to the virus could hardly be given. In colour and consistence the "Berlin Drink" resembles milk; and if administered to an animal not inoculated with the poison of rabies, it has no more effect than a cup of milk would have. If, on the contrary, the poison has entered the blood, the effect of the antidote is very different: it seems to course through every vein like fire, to rack every nerve, and to convulse the system from head to foot. Human patients affirm the agony to be intense; and it is painful to witness its effect upon a dog. But the struggle is very short; and though, of course, the shock and excitement leave the patient a little weak and depressed, we are told that its administration has never been followed by any fatal result.

Besides the "Berlin Drink," there is another, called the "Hertfordshire Drink," or Webb's remedy. To this Mr. Blaine alludes in his *Rural Sports*. "The tree box," he says, "is one of the oldest reputed preventives made use of. Mention appears to be made of it in the writings of Hippocrates; Galen and Celsus likewise speak of it. It has continued to be used from their time to the present, and it forms the active principle in the remedy common in several counties, but in none more than in Hertfordshire, where it is known, as we stated, under the name of 'Webb's drink,' from the family name of the persons who prepare it. The rue which enters into it, in equal proportions, we have little dependence on. The *buxus*, or box, has long been known in India also; it is still used there as a preventive of rabies; but it is, we believe, the

dwarf box that is there used, and is usually united with a decoction of the horn of the rhinoceros. As from our own experience, and the testimony of others, we are inclined to place some dependence on the preventive properties of the tree box, we shall introduce the original *formula* of 'Webb's Drink,' as gained by ourselves from one of the family dispensers of it, whose oath was taken as to its being the genuine receipe:—'Take of the fresh leaves of the tree box, two ounces; of the fresh leaves of rue, two ounces; of sage, half an ounce; chop these finely, and after boiling them in a pint of water to half a pint, strain and press out the liquor; beat them in a mortar, or otherwise bruise them thoroughly, and boil them again in a pint of new milk, until the quantity decreases to half a pint, which press out as before. After this, mix both the boiled liquors, which will make three doses for a human subject. Double this quantity will form three doses for a horse or cow; two-thirds of it is sufficient for a large dog, calf, sheep, or hog; half the quantity is required for a middle-sized dog; and one-third for a smaller one. These three doses are said to be sufficient, and one of them is directed to be given every morning fasting. Both human and brute subjects are treated in the same manner, according to the proportions specified.'"

Upon this specific Mr. Blaine places a considerable, but not a full reliance. He says, however, that whenever a very useful or a favourite dog was in question, he should make a trial of it; at the same time he would watch the animal with the utmost attention.

The opinions of experienced sportsmen upon rabies and its modes of treatment by practised veterinarians, are well worthy of an extensive diffusion amongst the people. Mr. Youatt, who had even more experience in the treatment of this disease than Mr. Blaine, remarks—"The veterinary surgeon, when operating on the horse, cattle, or the dog, frequently has recourse to the actual cautery. I could, perhaps, excuse this practice, although I would not adopt it in superficial wounds; but I do not know the instrument that could be safely used in deeper ones. If it were sufficiently small to adapt itself to the tortuous course of small wounds, it would be cooled and inert before it could have destroyed the deepest portions of the wound." He states a case in which several horses had been bitten, and, on lunar caustic being applied to one, it was saved; the hot iron to the others, which were lost: mentioning other cases in which caustic was efficacious, and the cautery perfectly useless. Liquid and other applications of a soft or semi-fluid mass, have a tendency to aggravate the disease, by re-inoculating the injured parts; while, by the effects of *lunar* caustic, it being dry, hard, and insoluble, this danger is avoided.

M. Guerin-Meneville, some time ago, brought before the French Academy of Sciences a means of curing hydrophobia, which, he stated, is practised in Russia with success. A little insect, the golden cetonides, found in considerable quantities on rose-trees, is proved, when pounded to a powder, and administered internally, to produce a profound sleep, which sometimes lasts for thirty-six hours, and which has the effect, in many cases, of completely nullifying the hydrophobic affection. A distinguished entomologist of Russia, M. Motschouski, has tried several experiments with this insect, and in most cases with success.

Whatever virtue there may be in these specifics, we fear it will be a long time before they receive a very extensive application; therefore it is to the cautery or to the knife that recourse must be had to prevent danger, or, perhaps, death, resulting from the bite of a rabid animal. Mr. Blaine says, that three times his life had been endangered by the bites of mad dogs, and three times he had to suffer cauterisation, excision, and some mental agitation, as, doubtless, every one must suffer who has had the misfortune to be subjected to such an evil. What his experience suggested him to do to himself, we would recommend to be done to others, in the absence of other curative means, which may be less severe, and, we may add, probably less effective.

We have hitherto treated of this malady in its most acute form. We will now briefly consider its other state, which appears in what is called

DUMB MADNESS.

This kind of rabies is so called from the animal affected by it exhibiting an absolute

dumbness, which arises from the swelling in the pharynx being so great as to deny to the dog the power of barking. The symptoms of this complaint are, a dull, stupid look, accompanied with costiveness, and a constant rubbing of the jaws with the paws, as if he would dislodge a bone that had stuck in his throat. The disease causes death between the third and seventh days; generally on the fourth or fifth. A common symptom, and not altogether confined to this species of madness, but also to be found in the acute disease, is an inclination to pick up straw, hay, litter, and other materials, to make a bed with it, but more frequently to tear it to pieces. "It is likewise very common to observe dogs scratch the litter under them with their fore feet, not as when making their beds, but evidently to press the straw or litter to the belly." There is also exhibited a disposition to pick up substances which, when the dog is in health, are wholly averse to his nature. He gnaws the boards upon which he may be lying; is irritable, mischievous, and treacherous. This is, however, mostly before the disease has attained to that strength of character by which it is sometimes marked. When it has arrived at its height, neither irritation nor delirium are very apparent; on the contrary, there is displayed a peacefulness of disposition, which does not arise from the inability to bite, but from the really disinclination to do so. The jaws begin to lessen; increased paralysis takes place; and, like a drunken man, without consciousness, the animal begins to stagger about, until he tumbles, only to struggle to his legs again. He now seats himself on his rump, looks melancholy in the extreme, and in this position expires without an apparent pang.

There are other diseases to which the dog is subject, and which are not unfrequently confounded with madness. These it is important to know. "Thousands of valuable dogs," says Mr. Blaine, "have been destroyed as mad, which have laboured under other affections, as distemper, colic, epilepsy, &c. And also thousands of owners of dogs and others have been needlessly rendered miserable by having been bitten by dogs innocent of any rabid affection. On the other hand, it is even more important that the real criterion of rabies be set forth, that due precaution may be taken when necessary. Epileptic fits, whether occasional, or the consequence of distemper, are often mistaken for rabies; but it should be remembered, that there is no rabid symptom whatever that at all resembles a fit, whether in the irritable or in the dumb variety; we use these terms as being significant, although by no means scientific. An epileptic fit is sudden; it completely bewilders the dog, and, after a determinate period, leaves him perfectly sensible, and not at all irritable, but exactly as he was before: in rabies there is no sudden fit, no loss of recollection, no tumbling about wildly in convulsions; neither is there any marked bark in the natural irritability attendant on madness. If a dog in an epileptic fit should be so convulsed as to attempt to bite, it is evidently done without design; its attack is spasmodic, and pain may make him seize anything, and it is quite as likely to be himself as any person or thing besides. The irritability and mischievous attempts of the rabid dog have always method with them, and they evidently result from the mental purpose to do evil; he usually manifests a disposition to rove; the distempered dog never does so. A puppy in distemper, particularly if he have worms, may pick up stones, or eat coals; or he may, in a trifling degree, pick up other unusual matters as food; yet no dog but a rabid one will take in hay, or wood, coals, or rags, or will distend his stomach almost to bursting. Lastly, the mistakes likely to occur between rabies and other diseases, are, in some degree, attributable to erroneous pictures drawn by authors of such diseases. Thus, Dr. Jenner's account of the distemper, instead of deserving the praise his great name has drawn down upon it, is entirely calculated to mislead; indeed, it might be supposed, by his readers, that he was purposely describing rabies, and not distemper. We could produce many similar instances in other authors, as Dr. Parry, &c."

CANKER IN THE EAR.

This is a disease very common in all water-dogs, such as poodles, spaniels, and Newfoundlands, arising from the quantity of hair they usually have about their ears, retaining the moisture within their cavities, and causing an

afflux of humours towards them. The earliest symptoms show themselves by the animal shaking its head, holding it to one side, and violently scratching the ear. Immediately on these signs being perceived, a curative process should be entered upon; and what this is to be, and how proceeded with, must greatly depend upon the habit of the dog. If the animal is fat, his system must be reduced by purgatives and abstinence; he must have plenty of air, and plenty of exercise, that the fluids of the body may be diverted into another channel. If his skin is infected with mangy irruptions, causing him to itch, he must have a vegetable diet, accompanied with cleansing, alterative, and purging medicines. Mr. Richardson recommends the ears to be well washed with warm water and soap, and then syringed out with a solution of sugar of lead, in the proportion of about a teaspoonful of the lead to one pint of distilled water. If distilled water cannot be procured, use rain water. Besides this, the washing should be repeated twice or thrice daily, and the bowels of the dog kept open by a daily laxative; if these remedies fail, a seton must be run through the back of the neck, and strong doses of *aloes* given every second day.

Mixing of burnt alum with a little sweet oil, would, perhaps, be better than with water, in a case of canker, on account of the wax and the greasy nature of the inside of the ear, which throws off water. Cancer in the human frame has hitherto been found incurable when it cannot be got at; and when it can, cure has been considered very doubtful. Unless the roots are destroyed, the cancer will grow again, as is most frequently the case after cutting.

We have understood that canker in the ear has frequently been cured in little spaniels by the application of a solution of alum and water. It should be just warmed, so as to take off the chill; and a few drops poured into the ear, and worked about in it for a few minutes. The complaint generally shows itself by a white discharge of matter, which can be seen on examination far down in the ear.

We have also heard of a dog of six years old being cured by having put into his ear a piece of mercurial ointment, about the size of a horse-bean. Should the cure not be effected in the first instance, another *bean* should follow it shortly.

Mr. Blaine recommends, for external applications, first, the use of a wash, composed of half a drachm of sugar of lead, dissolved in four ounces of rose or rain water. "A small teaspoonful may be introduced, previously warmed to a blood-heat, to prevent surprise, night and morning, rubbing the root of the ear at the same time, to promote the entrance of the wash into the cavities. In more obstinate cases, it is prudent to add fifteen or twenty grains of vitriolised zinc (white vitriol) to the wash; or rather make two distinct articles, and alternate the use of each, which will prevent the chemical decomposition of these medicinal agents, as the suspending menstruum; and, likewise, instead of water, use a decoction of oak bark, which will greatly promote the end desired. Now and then acetate of copper (verdigris), mixed with oil, has proved beneficial, when introduced in the same manner. In others, calomel and oil have produced amendment, when applied in the same way. We have, also, seen a weak injection of corrosive sublimate succeed, when every other application has failed. A very mild injection of nitrate of silver, as one grain to two ounces of water, has benefited others; for in this, as in mange, and indeed in all skin affections, no one remedy is a universal panacea; happily, however, there are few cases but will submit to a patient trial of various means."

Canker on the outside of the flap of the ear, and abscess of the inner surface of the ear-flap, frequently afflict the smooth-eared dogs. For the former, an ointment, composed of equal parts of nitrate of quicksilver and calomine cerusc, is recommended. It should be applied once a day, and care taken, by making use of a sort of head-dress, not to have the ear injured by the dog shaking his head. If the canker prove obstinate, however, excision must be resorted to. For the latter, the tumour ought to be opened its whole length, and a pledget of lint introduced, to prevent too hasty a reunion of the edges of the ear; or a seton should be inserted, and allowed to remain in it for eight or ten days.

WORMS.

To the accumulation of worms in the intes-

tines dogs are very subject. They are of three kinds:—*Ascarides*, or small thread-like worms, not more than half an inch in length. The seat of these is principally in the rectum; and hence the common symptoms of their presence is the dog dragging his fundament along the ground. Puppies are frequently afflicted with them. The *teres*, but of a *white* colour, and having the form and appearance of an earth-worm. The *tænia*, or tape-worm, several inches in length, and *flat* for nearly its whole extent.

Another description of worm, peculiar to very young puppies, and generated in their intestines in great quantities, is known to dog breeders. It is described as being from two to four inches in length, of a dirty-white colour, round, and pointed at both extremities. Sometimes this kind of vermes collect in balls or masses, to the number of a dozen or more in each mass. When puppies have them they usually fall away in flesh, until they actually reach the extreme of emaciation; when fits supervene, and death soon carries them off. The deaths are attributed to *distemper*; but worms are the true cause, and these of the description here described.

From the circumstance of hounds sometimes vomiting worms similar to earth-worms, it has been supposed that these have their seat in the windpipe. If this be the case, it has been recommended that they should have thirty drops of spirits of turpentine, suspended in a little castor-oil, every other day, for about a week; or they might be allowed to inhale chlorine gas for about half-an-hour, but not to have more gas in the kennel than a man can, without much annoyance, bear himself.

About a teaspoonful of ground glass mixed in lard has also been recommended for fox-hound puppies afflicted with this malady. They take it without trouble when fasting; and in about twelve hours, some Glauber's salts, in milk, after being dissolved in hot water, should be given to them. This they will lap up readily.

Mr. Richardson found the following mode of treatment efficacious, and, as he had great experience in rearing puppies, his advice is exceedingly valuable:—"Give, say on Monday, a small pill formed of Venice turpentine and flour, from the size of a very minute pea to that of a small marble, according to the size and age of the pup. The former will suffice for Blenheim or King Charles' pups, Italian greyhounds, &c.; the latter for bloodhounds, Newfoundlands, mastiffs, &c. On Tuesday, give a small dose of castor-oil; a teaspoonful to the smaller, a tablespoonful to the larger breeds: in neither case, however, quite full. On Wednesday, give *nothing;* on Thursday, give the turpentine as before; on Friday, the oil; on Saturday, nothing; and so on.

"Keep your puppies' beds dry, clean, and sweet. Do not feed them too often, or on food of too nutritious a quality. Puppies should not be fed oftener than three times a day. The morning and evening meals may be given at 9 A.M. and 7 P.M., and should consist of vegetables—potatoes, oatmeal, &c.—well boiled, and given with milk. At two, you may give meat with the mess, but not too abundantly. Between the meals give a drink of buttermilk, or milk and water."

The general symptoms of the presence of all or any of these worms are:—Fœtid breath, staring coat, voracity, or total loss of appetite; violent purging, or obstinate constipation, with great emaciation, sometimes fits. Venice turpentine is a good remedy, and is effective in slight cases. Aloes are useful for dislodging worms from the rectum, as they pass down the intestines, almost unchanged; but powdered glass is the safest and most efficacious. Give it in pills formed with butter and ginger, and covered with soft paper.

THE YELLOWS.

This is the disease which Mr. Richardson treats under the head of Jaundice, and to which young dogs are very subject. It is often the precursor of distemper, and arises from an affection of the liver. Its symptoms are a general dullness, a disinclination for food, a yellowness in the whites of the eyes, as also over the surface of the skin; a dry and parched mouth; a general emaciation and debility, accompanied with vomiting greenish matter; loss of consciousness, often succeeded by death.

If taken in time it may be cured; but it makes its approaches so imperceptibly, that it has frequently fastened in the animal several weeks before it has been observed; and, in

such cases, death is the inevitable result. When perceived in time, Epsom salts, with mucilage of gum-arabic, or very well boiled gruel, are recommended. Should the disease have only just appeared, common salt will answer the purpose in the absence of the other articles. Calomel and colocynth, in the form of a pill, and in small doses, administered at night, and succeeded in the morning by some opening medicine, will usually effect a cure; but, if there be much fever, bleeding must be resorted to. When the appetite returns, only small quantities of light food should be allowed.

As a tonic alterative, Mr. Blaine recommends the following:—Mercurial pill, one drachm; aloes, two drachms; gum myrrh, gum benjamin, balsam of Peru, of each one drachm and a-half; make into a mass, and divide into ten, fifteen, or twenty balls, according to size, age, strength, &c., of the dog: give one every evening, and, in a bad case, every morning also. Avoid bringing on active salivation, and active purging likewise, after the first purging dose recommended.

DISTEMPER.

This is the most fatal disorder, after rabies, to which the canine race is liable; and, we believe, it originated in France, where it is known by the name of *La Chaladie*. It is little more than a century since it was known in this country, and since that time it has played havoc among some of our best breeds of dogs. Some French authorities ascribe its origin to England; but others, better informed, and more candid in their sentiments, acknowledge that it originated in France. It is, however, of little consequence to us now where it was first known; of far more value would be the knowledge how to prevent it from affecting our dogs, how to check it, and how to cure it. Almost every dog, at some period of his life, is affected by it; and when it appears in an old one, there is little chance or hope of his recovery. The more excellent the breed, it would appear, the more susceptible is it of the disease. Animals of the inferior order have it often very slight, and the Colley of Scotland gets over it without any medicines whatever in a few days. Dr. Darwin describes it as a debilitating catarrh; but, as he mistook the character of the disease, or rather limited the seat of its operations, the *rationale* of his prescriptions was wholly unequal to compete with it. Dr. Jenner's description was worse. He was a great man, or rather, perhaps, a man with a great name; but he erred egregiously in reference to the dog-distemper. Mr. Youatt says, that his description of it was no more like the true disease than himself was like unto Hercules. "I have," Mr. Youatt continues, "again and again, put the power of his boasted preventive (vaccination, as in small-pox) to the test, and I can say, without the slightest hesitation, that it is altogether without effect. I know many gentlemen who have placed implicit faith in the power of vaccination, and their whole kennels have been submitted to the operation; the season has been favourable, and the disease either has not appeared, or has assumed the mildest type, and I have got into sad disgrace; but many years have not passed, before the distemper has broken out, and carried off the majority of those who were supposed to be exempted from its attack."

The symptoms of distemper are usually loss of appetite, fever, weakness of the eyes, dulness, a discharge from the nose, discharge from both the eyes and the nose, a short husky cough, emaciation, a fœtid smell; sometimes *fits*. Dogs in a fit are sometimes mistaken for *mad;* but it should be remembered that fits are *never* an accompaniment of rabies.

The distemper is a disease of the *mucous* surfaces, and usually has its commencement in nasal catarrh. If it is detected in the first stage, bleeding copiously will do good. Give an emetic, and follow it up by a gentle purgative; if—as is generally the case when the above treatment does not effect a cure—inflammation of the lungs supervenes, more blood must be taken, and more aperient medicine, with occasional emetics, given. If the animal become weak, and is apparently sinking, mild tonics, as gentian or quinine, must be administered; and if he will not eat, some strong beef jelly should be forced down his throat. A seton in the back of the neck is often useful, but should not be used indiscriminately. To save all this trouble, however, the best thing to do is to place the dog in the hands of a veterinary surgeon.

The causes of distemper are, generally, cold; suddenly throwing a domesticated dog into the water, or not properly drying his coat after being washed. They are, however, various, and, to a considerable extent, inscrutable; for any derangement of the system may bring it on. It is remarked in the *Encyclopædia of Rural Sports*, that the effects of distemper in different breeds of dogs used in rural pursuits, or those which live mostly in the open air, are comparatively slight; but, wherever man has interfered, and forced an artificial breed by educating them to artificial purposes, or closely confining them, in such, the disease acts with great severity. Hence it is so fatal to high-bred hounds, pointers, setters, and spaniels; and to terriers and greyhounds, as breeds even more artificial than the others, it is usually more so. Mr. Youatt observes, that few dogs imported into this country, as exotics, do well in it. In proof of this, it is known that the larger number of the northern dogs, brought here by Captain Parry, were swept away by it within twelve months. Some breeds have an hereditary predisposition to be afflicted in a far greater degree than others of the same kind. Litter after litter of some sporting strains, will hardly yield more than one or two survivors; and, in such cases, we would advise the breeder to cross the race. In crowded cities the disease is both severe and fatal. In London, those that are attacked by it have little chance of recovery compared to those that are attacked in the country, where the air is so much more pure, and where the lungs are less likely to suffer by it.

As in all diseases in which there is difficulty, in treating for distemper, various modes have been adopted. Some think it best, on its first appearance, to give their dogs emetics and purgatives. They begin by keeping the dogs warm, and then administering James's powders and hot baths, if necessary.

It does not do to place a dog in an out-house, and to content yourself with looking at him, with your hands behind you, and saying "poor fellow" to him two or three times a day.

A gentleman of the old school, gave to his puppies, Scotch pills and James's powders. The animals were then kept in an out-house, made as warm and comfortable as a lady's parlour; and success generally resulted from this treatment. A great matter in this disease is promptitude of action. This same gentleman lost a most promising greyhound puppy, entirely through dilatoriness. The dog was out in the yard; and although the owner was told of his condition by one experienced in canine diseases, he did not take proper measures to check it. He was going out for a walk with his wife, intending "to see him when he came back;" and a few days afterwards the dog was dead. Knowing how soon some people tire of animals when any sickness or trouble comes, this does not surprise us; and the conduct of this gentleman is by no means exceptional, for there are hundreds like him. To such, however, the life of no valuable dog should be intrusted.

For the cure of distemper, one table-spoonful of castor-oil and a piece of garlic bruised, and given every day, has been found extremely effective. It has been repeatedly tried, at the same time keeping up the dog, or not allowing him to get low. We have known a dog perfectly paralysed from the distemper; but by giving the above for ten days or a fortnight together, and then, when it seemed, in some degree, to have lost its effect, Benbow's Alterative Mixture, for a few days, afterwards returning to the castor-oil and garlic, completely restored him.

Every sportsman has his own specific for this disease; and the following will be found, we think, as excellent as any:—12 grains of tartar emetic; 6 do. of opium; 4 do. Peruvian bark; 2 do. nitre; 2 do. camphor. To be mixed up into nine balls, and two to be given every other day to a full-grown dog; one to a puppy.

Tonic on beginning to Recover.—24 grains of quinine; ½ ounce of gentian powder; ½ do. of bark in powder; 1½ do. of lemon-juice, or 8 drops of sulphuric acid. To be made into eight balls, and one to be given every other day.

Valuable as these opinions and recipes may be, however, we must make room for some apt remarks by another, in reference to the "infallible remedies" which have been supposed to have been discovered for this disease, as well as for a portion of the *rationale* of his own treatment of it.

"The treatment of distemper," says this experienced veterinarian, "must necessarily vary considerably, according to the nature of

the attack, as well as the age, constitution, and locality of the object of it. It is somewhat singular, that while the very best practitioners so often fail in their treatment of the complaint, we seldom have met with a sportsman, or breeder of dogs, who, according to his own account, could not readily cure it, 'being in possession of what he flattered himself was an infallible remedy.' We once thought a remedy of our own discovery almost so; but though it remains a valuable one, it is far from infallible; and we suspect most of these are much further from deserving such a character than that we allude to. It happens, however, with these fancied infallible remedies for distemper among gentlemen, that under the exhibition of some supposed curative, they have met with two or three successful cases, which would, perhaps, have done well without anything; such medicament has been afterwards considered as the grand specific. But continued experience leads us to a conclusion that, although many different remedies are useful, according as one or other form of the disease prevails, yet that there is not, and we believe cannot be, a universal specific for this Protean disorder. As most cases of distemper commence by cough, or slight running from the nose and eyes, with loss of flesh, appetite, and spirits, an emetic is the first remedy, as it clears the stomach and bowels, and sympathetically lessens the inflammatory action going on. Should the pulse, the state of breathing, or a harassing cough, indicate any great determination to the lungs, take from three to five or six ounces of blood away, according to the size, age, &c.; particularly if the dog be fat and moderately strong. If bleeding is omitted, substitute a mild purge, if the bowels are not already relaxed. Emetics are useful as preparatory medicines in distemper; indeed very useful. Strong dogs may take from two to four grains of tartar emetic; or otherwise from four to six or seven grains of calomel. Sometimes one, and sometimes the other of these remedies is to be preferred. When there is any disposition to purging, already observed, give the tartar emetic only, from one grain to four, as a maximum; or the vomit may be made of equal parts of calomel and tartarised antimony, from one grain to three grains of each; or even four grains of each may not be too much for a full-grown dog of the largest breeds; and further, this latter vomit has the advantage of proving a laxative also. The purging and emetic articles used on these occasions by sportsmen, as Turpith mineral and crude antimony, are, from their drastic qualities, objectionable; and they can only be admissible for very strong dogs, not yet at all debilitated by the complaint; indeed, it is only in such cases that these violent remedies may be risked. Of this kind are large doses of salt, which occasionally do good when no looseness of bowels has already come on. The early insertion of a seton should depend on circumstances: if an impatience of light present itself, and the pupils look red within, the cough being hard, dry, and frequent, insert one; but if, on the contrary, the discharge from the eyes and nose is become purulent and profuse, and particularly if the dog be losing flesh daily, by no means do so. While the dog is fat, should his inflammatory symptoms run high, two or three moderate purges are proper; but when distemper is at its height, always avoid them. Costiveness, however, must be combated; but do it by laxatives only in these cases: as already observed in other cases, a brisk purgative is admissible and highly proper; for unloading the bowels, like unloading the stomach, will tend greatly to lessen irritation, and reduce the inflammatory action of the heart and arteries; but, at the same time that, under these views, they are valuable agents, we must not lose sight of the diarrhœa, which is so fatal a symptom of the disease, and which too free a use of them might tend to bring on. These primary depleting means having been carried into effect, proceed with the following febrifuge:—Antimonial powder, two, three, or four grains; nitrate of potash (nitre), five, ten, or fifteen grains; powdered ipecacuanha, two, three, or four grains; powdered myrrh, four, six, or eight grains. Make into a ball with a minor, medium, or major quantities, according to the size and age of the dog, and give two or three times a day, as the symptoms are more or less urgent, diminishing the quantities if they occasion sickness. When the cough is very distressing, by which pneumonic symptoms may be apprehended, add to each dose of these from half a grain to a grain of digitalis

(fox-glove). Should nothing new in the symptoms occur, and your patient remain strong, every third or fourth day repeat the emetic, and keep the bowels open; but now, more than ever, avoid active purgation."

The natural medicine of the dog is an emetic, he being easily excited to vomit. Whenever anything ails him, he himself runs to the dog-grass, eats it, vomits, unloads his stomach, and is at once well. In distemper, therefore, a vomit is the first thing to be given, no matter what form the disease may have assumed. If nothing else is at hand, Mr. Youatt concurs with Mr. Blaine in recommending common salt; but the best form of an emetic consists of a combination of equal parts of tartar emetic and calomel. From half a grain to a grain and a-half of each will constitute the dose. When calomel is given in too strong doses, it acts with great severity on the dog. The following is a case reported in the second volume of the *Veterinarian*, when that medicine has been too freely administered:—

"*August* 30*th*, 1828.—A spaniel, six months old, has been ailing a fortnight, and three doses of calomel have been given by the owner. He has violent purging, with tenesmus and blood. Half an ounce of castor-oil administered.

"*August* 31*st*.—Astringents morning, noon, and night.

"*September* 6*th*.—The astringents have little effect, or if the purging is restrained one day, it returns with increased violence on the following day. Getting rapidly thin. Begins to husk. Astringents continued.

"*September* 10*th*.—The purging is, at length, overcome; but the huskiness has rapidly increased, accompanied by laborious and hurried respirations. Bleed to the extent of three ounces.

"*September* 11*th*.—The breathing relieved; but he obstinately refuses to eat, and is forced several times in the day with arrow-root or strong soup.

"*September* 18*th*.—He had become much thinner and weaker, and died in the evening. No appearance of inflammation on the *thoracic viscera*, nor in any part of the alimentary canal. The intestines contracted through their whole extent."

For this scourge of dogs there is unhappily no specific that can act remedially in all cases. It assumes such a variety of forms, that it baffles the skill of the most eminent veterinary practitioners. "A disease attacking so many organs," says Mr. Youatt, "and presenting so many and such different symptoms, must require a mode of treatment varying with the organ attacked, and the symptom prevailing. The faith in these boasted specifics is principally founded on two circumstances—atmospheric influence, and peculiarity of breed. There are some seasons when we can scarcely serve a dog; there are others when we must almost wilfully destroy him to put him out of sight. There are some breeds in which, generation after generation, five out of six die of distemper; while there are others in which not one out of a dozen dies. When the season is favourable, and the animal, by hereditary influence, is not supposed to assume the virulent type of the disease, these two important agents are overlooked, and the immunity from any fatal result is attributed to medicine. The circumstances most conducive to success, will be the recollection that it is a disease of the mucous surfaces, and that we must not carry the depressing and lowering system too far. Keeping this in view, we must accommodate ourselves to the symptoms as they arise."

Palsy, more or less complete, is occasionally the termination of the distemper in dogs; and when accompanied by chorea, the case is generally beyond the reach of curative means.

In the *Transactions of the Medico-Chirurgical Society*, we are informed that this disease is not communicable to man. Neither the effluvia arising from the diseased dog, nor his bite, have proved in any instance infectious; but as the disease has often been confounded with canine madness, it is to be wished that it was more generally understood; for those who are bitten by a distempered dog, are sometimes thrown into a state of such terror, that actual symptoms of hydrophobia have arisen from the mere workings of the imagination. An instance of this occurred in a gentleman who received a severe bite from a dog, and who afterwards fancied the animal was mad. He felt a horror at the sight of liquids, and, on attempting to swallow them, was

actually convulsed. So uncontrollable were his prepossessions, that the celebrated John Hunter, to whom we are indebted for the fact, conceived he would have died, had not the dog which inflicted the wound been found, and brought into his room in perfect health. This soon restored his mind to a state of tranquillity. The sight of water no longer afflicted him, and he quickly recovered.

MANGE

Is of three kinds—common mange, the red mange, and the scabby mange.

So early as the twelfth century, insects were found to burrow under the skin of the human being; and in the seventeenth century engravings of them were executed and produced. Similar insects infest the lower animals. Placed on the skin of a healthy individual, they give rise to a disease having all the characteristics of scabies. If taken from mangy dogs, horses, or sheep, and placed on healthy individuals of the same species, these will at once receive the affection. It has been, in many cases, proved that scabies in man has been produced by contact with the lower animals. The disease of mange, Mr. Youatt considers, to some extent, to be hereditary: a mangy dog is likely to produce mangy puppies; and the offspring of a mangy bitch will sooner or later show the disease.

Common mange is well known, and will, with attention to cleanliness, accompanied with slight daily alterative doses of sulphur and nitre, soon be cured; but if neglected it is apt to run into scabby mange, when the skin becomes blotched, the dog emaciated, the belly swollen, and death frequently terminates the sufferings of the miserable animal. In cases of this kind Mr. Richardson recommends an aperient for a day or two; then, for a week, the alteratives named above; next, well washing with soft-soap and water; and then rubbing him over with the following prescription:—

Train Oil	1 pint.
Turpentine	1 ounce.
Naphtha	1 „
Oil of Tar	1 „
Soot	1 „

And—Sulphur, in powder, sufficient to make the stuff of a proper consistence.

"This is to remain on the dog for three days, during which time he must be kept dry and warm, and fed sparingly; let it be washed off on the fourth day with soft-soap and warm water, in which some common washing soda has been dissolved; give clean straw, plenty of exercise, and cooling diet, and the dog will speedily get well.

"When a dog is very bad, the skin or soles of the feet, and sometimes the claws, will come off, in which cases I would recommend steeping them in a decoction of strong oak bark and alum. It can be best done by tying the feet up in thick cloths, kept wet with the above mixture.

"Puppies are very liable to display a mangy-looking coat, at the age of from two to four months. The hair falls off in spots, and the skin becomes itchy, dry, and scaly. This is not genuine mange; but, if neglected, is apt to run into it. At this early stage it is easily cured by washing with soft-soap and water, and change of bedding; giving also a little sulphur in the food daily, and in very minute quantities. This appears to me to be only an effort of nature to throw off the old or puppy coat of hair, and assume the new one.

"Change of feeding is serviceable in the treatment of mange; but it is a mistake to suppose that the change must be to a reduced regimen. In many cases, mange is only the offspring of filth and hunger; and in these cases the change must be to clean bedding and generous diet. The change of food, however, should not be sudden; otherwise, not only may the existing disorder be aggravated, but other and less manageable affections may be superinduced."

When all things else fail, Mr. Youatt recommends a slight infusion of tobacco, cautiously used. If mercury is applied externally, care must be taken to prevent the dog from licking it, as diarrhœa, produced by mercury, often proves fatal. Much patience is necessary in curing this disease. Mr. Blaine had a favourite setter which was affected with a violent mange for five years. What misery must this poor animal have suffered during a period probably extending to nearly half of his life. He was ordered to be dressed every day, or every second day, before the disease was completely conquered. By this treatment, however, he finally recovered.

For the treatment of mange, Mr. Blaine recommends the following *formulæ*.

No. I.

Powdered Sulphur, yellow or black	4 ounces.
Muriate of Ammonia, powdered	½ „
Aloes powdered	1 drachm.
Venice Turpentine	½ ounce.
Lard, or ther fatty matter	6 „

Mix.

No. II.

Sulphate of Zinc (white vitriol)	1 drachm.
Tobacco in powder	½ ounce.
Sulphur in powder	4 „
Aloes in powder	2 drachms.
Soft soap	6 ounces.

No. III.

Lime-water	4 ounces.
Decoction of Staveacre	2 „
Decoction of White Hellebore	2 „
Oxymuriate of Quicksilver (corrosive sublimate)	5 grains.

Dissolve the corrosive sublimate in the decoctions, which should be of a moderate strength; when dissolved, add two drachms of powdered aloes, to render the mixture nauseous, and prevent its being licked off by the dog—a circumstance which ought to be very carefully guarded against.

COSTIVENESS.

Change the diet; give gruel and slops; and let the dog have full liberty; boiled liver will be found useful. If these measures fail, give small doses of castor-oil. No dog should be allowed to be costive longer than two days, as it may arrive at indigestion, generate worms, impart a fœtid smell to the breath, and blacken the teeth. The best means of preventing this disease is giving a sufficiency of exercise. This, perhaps, cannot be done with watch-dogs, which have to be kept almost continually on the chain in yards and public works; but, where it can be done, it should never be neglected. In cases where it is requisite to administer medicine, an aloetic ball may be given, or Epsom salts. Should these fail in producing the desired effect upon the animal, the castor-oil mixture, with spirit of buckthorn, and white poppies, should be administered; and recourse may be had to the clyster-pipe. Exercise, however, is the grand preventative.

DIARRHŒA

This disease is frequently met with in dogs that are habitually petted; and it is very often the consequence of improper food, or overfeeding. When it shows itself, wait for a day or two, till you see if the discharge will cease, and a cure take place, without the necessity of giving medicine. Should this not happen, give castor-oil, with a few drops of laudanum.

There are many other diseases to which the dog is subject; but as these have been already treated in scientific veterinary works especially devoted to them, we refrain from introducing them here, but refer the reader to Mr. Blaine's *Canine Pathology*, and the treatise of Mr. Youatt, on *The Dog*. In these works, every disease, so far as great experience has been able to determine its character, has been treated with judgment and skill; whilst ability, coupled with a desire to state nothing but what will bear the test of a trial, appears in every page.

MEDICINES USED IN THE TREATMENT OF DISEASE IN DOGS.

Dogs affected by disease should be handled with great gentleness; kept perfectly clean, and furnished with a warm bed. The medicines used in their cases are very numerous, and, as a general rule, should only be administered under the direction of a surgeon. They are given in the form of a pill, or bolus, or in a liquid state, most easily, by two persons—one sitting, and holding the dog between his knees, while the other forces the mouth open by pressure on the lips of the upper jaw, and administers the medicine.

Alcohol.—Used in tinctures, but never administered in a pure state.

Alum.—A powerful astringent: ten to fifteen grains may be given in obstinate cases of diarrhœa. It is sometimes used in the form of a clyster.

Antimony in the form of James's powders, used to produce gentle perspiration.

Alteratives are intended to produce a slow change in the system without interfering with other arrangements. Five parts sublimate of sulphur, one of nitre, one of linseed meal, and two of palm oil is a useful alterative.

Barbadoes Aloes.—An excellent aperient, consists of eight parts of powdered aloes, one part antimonial

powder, one part ginger, four parts palm oil—well beat up together, and made into balls of about half a drachm. Mr. Blaine says the smallest dog may take from fifteen to twenty grains, administered in half-drachm balls every four or five hours.

Blisters.—An infusion of two ounces of cantharides in a pint of oil of turpentine, kept on for several days, is a gentle blister, maintaining sufficient irritation and inflammation, without blistering the skin, to remove certain causes of lameness.

Calomel.—A dangerous medicine, but useful in small doses in cases of liver complaint, and, combined with aloes, in doses never exceeding three grains, in cases of virulent mange.

Castor Oil (*oleum ricini*) possesses the best properties of the fixed vegetable oils. Three parts of the oil, two of syrup of buckthorn, and one of syrup of poppies, form a useful medicine where a narcotic stimulant is requisite.

Catechu.—Extract of the acacia tree (*acacia catechu*), and possesses a powerful astringent property. Mixed with opium, chalk, and powdered gum, it stops diarrhœa. As a tincture, it assists the healing principle in hounds.

Chalk (*creta preparata*) is useful in combination with ginger. Catechu and opium in all cases of purging, particularly in the purging of distemper.

Chloride of Lime should be sprinkled, from time to time, in the kennel or dog-house, for purposes of cleanliness. It is useful for washing ill-conditioned wounds.

Clysters.—Applied when the nature and progress of disease renders necessary a quick evacuation of the contents of the bowels. It usually consists of warm water, rendered more stimulating, when necessary, by adding salts, oil, or aloes; for killing worms in the rectum, or larger intestines, using oils; for diarrhœa, using astringents; for nourishment, using gruel.

Digitalis.—Dried leaves of the fox-glove, which yield their virtues both to water and to alcohol. It is a powerful sedative narcotic, and is useful in all inflammatory and febrile complaints.

Epsom Salts.—A mild and effective aperient for most animals; but, for the dog, the castor-oil mixture is preferable.

Gentian.—The root of *gentiana lutea* is valuable as a tonic, febrifuge, and stomachic. It has little or no smell, but is bitter to the taste.

Ginger is considered an aromatic, and is less heating to the system than might be expected from its pungent taste. It is antispasmodic and carminative. It is also useful for dogs as a cordial and tonic.

Hog's Lard.—The basis of all ointments used in dog medicines, being free from every stimulating property.

Iodine.—A new medicine, found, however, to be very universally diffused throughout the vegetable and mineral kingdoms: it is rapidly superseding the cantharides and turpentine blister.

Lunar Caustic (*nitrate of silver*).—Recommended by Mr. Youatt as superseding all other caustics, and preferable, in cases of rabies, to the knife. It is also recommended, by the same authority, in cases of opuleseme of the cornea, and where there is fungoid matter thrown out on the cornea.

Nitrate of Potash.—A mild and cooling diuretic, given in doses of eight to ten grains.

Nitrate of Silver is applied for the same purpose.

Nitric Acid destroys warts and excrescences, by being dropped on the part, and bandaged. Nitrate of silver, however, is a surer application.

Palm Oil.—An excellent emollient when unadulterated, being milder than common lard.

Peruvian Bark is an excellent tonic in distemper, combined with iodide of iron.

Prussic Acid allays the irritation of the skin in dogs; it requires care, and may be fatal when the skin is abrased.

Sulphur.—An excellent alterative, and, combined with antimony and nitre, particularly useful in mange, surfeit, grease, and for dogs out of condition.

Turpentine.—An excellent diuretic and antispasmodic. It is also a most effective sweating blister, and highly recommended in strains.

Vinegar.—Useful for sprains, bruises, and fomentations.

DIVISION III.

SHOOTING, BY FIELD, WOOD, AND WATER.

CHAPTER I.

PRELIMINARY REMARKS; THE GUN.

To be "a good shot" is an enviable distinction in the eyes of many; and, perhaps, at no period of England's history was the art of handling the gun so much practised, so popularly esteemed as a kind of essentiality to the accomplishments of a country gentleman, as at the present time. Even the busy merchant in the city occasionally forgets the cares of his ledger, to have a day's shooting; whilst our tens of thousands of riflemen are daily practising an art which, whilst it has for its grand object the defence of our shores from foreign invasion, is, at the same time, inculcating a desire for field sports, far beyond what might be imagined by those who see nothing more in a rifleman but a civilian dressed in strangely coloured regimentals, and trained only to shoot at a target.

As one of the most captivating of British field sports, shooting has long held a prominent place; and we, ourselves, almost as far back as we can remember, have a lively reminiscence of a bachelor uncle of ours, who had long been in the West Indies, and who had passed the threescore-and-ten as the allotted period of man's life—taking us to the fields with him to practise partridge shooting, when it was with the greatest difficulty that he, himself, could see a covey twelve yards before him. We know of no sport that has so much to recommend it. Every one, however, has his hobby. Some delight in the quiet and solitary pleasures of the angle; some in hawking, which, by the way, is a noble kind of exercise; and some in the more violent sport of horse-racing. There is none of these, however, equal to the sport of the "dog and gun." Each, no doubt, has its individual charms to those who are so constituted as to make it an enjoyment; but the universality of "shooting"—of its practice in every country and clime—from the estimation in which it is held, and which, no doubt, in a great measure, arises from the open-air exercise which it causes, amid scenes exempted from the restrictions incident to artificial life, and redolent of all the charms of nature, whether belonging to the field or the forest, the moor or the mountain, has rendered this sport more general than any other. It is not all, however, that are allowed to enjoy even this sport as regards game. The law has stepped in to prevent this; and Byron has sarcastically noticed the fact in some of his lines.

"The corn is cut, the manor full of game,
The pointer ranges, and the sportsman beats,
In russet jacket—lynx-like is his aim,
Full-grown his bag, and wonderful his feats.
Ah! nut-brown partridges! ah! brilliant pheasants!
And ah! ye poachers!—'tis no sport for peasants!"

The lines alluded to certainly indicate the cause which has produced a direful chapter in the annals of British crime. But if game were not in some way protected, nobody but the farmer and the peasant would have anything living to shoot at. Some of these are constantly located where game is; consequently they would have all the sport to themselves; and the gentleman returning to his own estates in the country, after a residence in the city, or tour on the continent, would have nothing left for his own sport. The tables of his labourers and tenantry would be covered with game, whilst he would have none, except what he was forced to purchase with the hard cash from his own treasury.

THE GUN AND THE FOWLING-PIECE.

The origin of the word "gun" has not been determined with accuracy. In the *Encyclopædia Britannica*, we find it observed that some derive it from the French word *mangon*,

which was a warlike instrument used before the invention of the gun now made use of, and employed in discharging arrows, and other missiles, before the manufacture of gunpowder. Others derive it from *gyn*, an engine employed for similar purposes. Selden says, the word gun was in use in England, for an engine to cast a thing from a man, long before there was any gunpowder found out.

The *hand-gun*, or *goune*, as formerly spelt, seems to have been the rudimental shape of our present fowling and military pieces. It is said to have been invented by one Billius, a nobleman of Milan, and was nothing more than an iron tube affixed to a club, or stick, with a hollow, without a cover near the breech, or base, to receive the priming powder. In the reign of Henry VI., a small priming pan was invented and attached; but still the weapon was of the rudest description, and scarcely worth the name of being an instrument well suited for either attack or defence. The *stocked-gun* was the next step in its improvement. The barrel was placed in a wooden stock, or frame, which was at first straight, but which was subsequently altered to a curve, for the purpose of enabling the marksmen to take better aim, and to obviate, to some extent, the severity of the recoil, which was an inherent defect in the straight stock. The *match-lock* and *wheel-lock* guns followed in the order of change. The first was used with a lighted match, brought into contact with the priming by means of a spring-trigger. The second was made in the days of Elizabeth; but, though introduced into the arena of war, it was still a very defective weapon, and was not at all well adapted for heightening the pleasures of the sports of the field. This gun was fired by means of friction, through the means of a wheel, which passed rapidly over the edge of a piece of flint. It was but a heavy, clumsy, and unhandy affair. It was succeeded by the flint-lock, which was long retained in use, and underwent various modifications down to modern times. The more recent improvement is the *percussion-lock*, which is now in high favour.

There are few practical arts which have advanced so rapidly as the one which is marked by the making, or the manufacturing of guns. "Judging of the perfecting of the art by the expense of the article," says the *Encyclopædia of Rural Sports*, "we might be led to conclude that gun-making had reached the acmé of perfection. It has been no uncommon thing to pay fifty, sixty, or seventy guineas for a best London-made gun. The continent has even gone beyond us in this respect; for we are told, that when Napoleon I. was in the plenitude of his grandeur, he established a gun manufactory at Versailles; and, we are informed, that pistols were there made at 10,000 livres, or £100 sterling, each; and guns at 50,000 livres, or £2,000 sterling. Of these, the first consul often made presents to foreign princes, to general officers, and other favourites. The Marquis of Rockingham is also said to have given to Colonel Thomson a fowling-piece which cost £400; and that Messrs. Robert and John Wheeler, gun-makers, of Birmingham, presented George IV. with a gun of the most exquisite workmanship, which cost three hundred guineas.

The *barrel* of a gun is of the first consideration, both as regards its construction and the manner in which it is kept in order. *Iron* is the principal component part in its manufacture, and the *kind* of iron is of the last moment. The best description of this metal is that which possesses the highest degree of tenacity and ductility. Swedish iron is allowed to possess these qualifications or properties in an eminent degree, and is, therefore, almost universally employed in the manufacture of gun-barrels of any considerable value. It must be observed, however, that this article, like many others, is often made for *sale*, and not for *safety;* and that spurious and cheap pieces are made from kinds of iron that render them dangerous and worthless. When iron is mixed with certain mineral substances, it becomes unfit for safe gun-barrel making; but as every sportsman is not possessed of the scientific attainments of an expert chemist, nor has the pretensions to understand the art of gun-making, people are necessarily left, in a great measure, to chance, for the sort of instrument so necessary for their sport, as well as for their personal safety. The most prudent plan to adopt is, to deal with gunsmiths of acknowledged skill and reputation, and who make a point of issuing from their shops only such instruments as will prove both safe and effective.

Without aiming, however, at a scientific knowledge of iron or of gun-making, a sportsman should, nevertheless, be acquainted with a few plain principles respecting the quality of the materials of which his instrument is made, as well as of its adaptability to the purposes for which it is designed. *Spanish* gun-barrels have long been highly prized, and generally very justly. They are made of a species of iron remarkably well hammered, and which has received the technical name of *scraps*, being chiefly composed of the old nails taken from the shoes of horses, mules, and asses, used as beasts of burden in Spain. The *Damascus* barrels were once more highly esteemed than they are now. They were made of highly-tempered iron and steel, hammered with extraordinary labour, and polished to the highest perfection. There are several kinds of iron which are now generally used for fowling-pieces; such as *wire-twist iron*, *Wiswould's iron*, *charcoal iron*, *stub-twist iron*, *twopenny*, *and threepenny skelp iron*, and *sham-dam skelp*. Among all these varieties, the stub-twist is considered the best; but it is high-priced, and, like most other things of value, liable to considerable adulteration. When it can be obtained pure, most gun-makers are inclined to give it a decided preference, both for shooting purposes and safety.

A military treatise, written upwards of 240 years ago, gives us what may be considered, even in these advanced times, good advice as to the choice of a gun. We will modernise the spelling for the benefit of all our readers.

"He that loveth the safety of his own person, and delighteth in the goodness and beauty of a piece, let him always make choice of one that is double-breeched; and, if it be possible, a Milan piece, for they be of tough and perfect temper, light, square, and big of breech, and very strong where the powder doth lie, and where the violent force of the fire doth consist, and, notwithstanding, thin at the end. Our English pieces approach very nigh unto them in goodness and beauty (their heaviness only excepted), so that they be made on purpose, and not one of those common sale pieces with round barrels, whereunto a beaten soldier will have great respect, and rather choose to pay double money for a good piece, than to spare his purse and endanger himself."

The following is the test of Mr. Greener for discovering different gun-metal from the real stub-twist iron:—"Require the gun-maker to stain the barrel under examination with the *smoke-brown* (a staining composition, of which he gives an account in his book), and he will not be able to accomplish it if the barrel be not genuine; whereas nothing is easier, if it be really made of stubs twisted. The matter may be thus explained:. hydrogen gas acts only on iron; steel resists its action; so that, when a barrel is properly finished, the steel remains quite bright, while the iron has become a beautiful jet-black, which will be easily recognised by attention to the appearance."

Testing gun-barrels is such an important matter to all who have to use them, either for amusement or war, that the legislature has been obliged to step in, for the purpose of endeavouring to save individuals from serious injuries, and often from death itself. It is not always from a defect of the metal of which a fowling-piece is made, that danger arises, but often from some defect in the workmanship, whence danger, and often serious consequences result. For a long time this country suffered severely from the want of proper attention to this subject; but the gun-makers themselves took the matter up, and established a proof-house, by which barrels could be tested. In 1813, this trade was incorporated by act of parliament; and by the powers granted to it, it was made penal to sell any gun without its being first proved at one of the proof-houses, established by the company in London and Birmingham. These enactments, however, were evaded; and such numbers of spurious instruments were thrown into the market, that the legislature had again to come to the rescue, and pass, in 1815, another more stringent enactment. "It was enacted that no barrel should be received by any person to rib, stock, or finish, that had not been duly proved, under a penalty of £20." It was also enacted that all barrels should be immediately dispatched, by the maker, to the proof-house before the same shall be sold, or transmitted for sale to any person whatever. A penalty of £20 is attached to the breach of this clause; and it further visits, with the like penalty, any one receiving such barrel to make up. The act also imposed the same penalty upon the forger

of the proof-mark of the London company, or that of the Birmingham company.

The mode of making gun-barrels is thus described in the article on "shooting," in the *Encyclopædia Britannica*; and although it may appear somewhat foreign to our subject, still, we think there are many who would wish to know something of this operation. "Having fixed, in the first place, on the size of the gun, and ascertained, as near as may be, the width of the bore, and the length and thickness of the barrel, the next thing the forger does is to take a portion of the metal of which he is to make the barrel, and to form it into the shape of a thin, flexible bar, something like a cooper's hoop; this bar or hoop must not be all of the same thickness; but that part of it which is to be towards, and is to form the muzzle of the piece, must be thinner than that which is intended to form the breech. An instrument, called a mandril, is then chosen, according to the size of the intended bore of the gun. The flexible bar or hoop is then heated, so as to make it ply easily, and is turned round the mandril, much in the same way as a riband of leather is turned round the handle of a whip. The edges of the hoop of iron, however, are made to overlap one another a little, so that, when welded, all their joinings may be compact and solid, and no slackness appear where the lips of the bar or hoop touch one another. When the metal has acquired its proper heat and the weldings are properly executed, the places where the bars overlapped each other are quite imperceptible; and the barrel appears as though it had been made out of one piece, and finished at one heat." The mode of making the twisted barrel does not materially differ from this description.

The use of the *double-barrelled gun*, in sporting, has greatly increased within the present century; and the instrument itself has undergone numerous important alterations and improvements. When first brought out, one barrel lay over the other, each having a separate pan, hammer, and hammer-spring. The barrels were consequently made to turn round at the part where their breeches were fixed to the stock; and it was so contrived that, when one barrel was fired off, the other was brought into its place by the simple pressure of a spring by the right hand, while, with the left, the barrels were turned on their common centre. This kind of gun was always esteemed an extremely clumsy and heavy instrument; and the locks were commonly so exceedingly complex, that it soon suggested further improvements in the make of this sort of gun. Accordingly, the next step in advance was an instrument that did not allow the barrels to turn round upon an axis; but, on the contrary, they were fixed one over the other, and each had a separate lock and trigger, which, for the under barrel, was, consequently, placed lower than the other. Still, although pieces of this construction possessed a great advantage over those made on the revolving principle, in the quickness of their firing, yet they were subject to one inconvenience, from which the others were exempt, and which arose from the situation of the under barrel; for that being fired under the same line of aim with the upper one, did necessarily shoot low.

The more modern plan, of placing the barrels in juxtaposition, or side by side with each other, is a great improvement; but there are still many things connected with guns of this description, which require consideration, with a view to readiness of use, and facility of movement. It has often been a matter of serious complaint, that each barrel is liable to be filed away too much at the breech, and likewise at the muzzle, in order to bring these two parts of the barrels as near together as possible. This renders the instrument unsafe. There are, also, important questions connected with the use of the double-barrelled gun, as to the way in which a true aim is to be obtained by it. These questions have, at various times, given rise to long discussions, both in sporting journals and sporting books, and very contrary opinions and suggestions have been arrived at. Still, there has been much light thrown on the general question, and decided improvements made within the last few years. In a past volume of the *Sporting Magazine*, it is asked—"What is the best method of making double-barrelled guns, so that a correct aim may be taken from the centre of the barrels?" To which the following reply is given:—"If the barrels were placed parallel to each other, it would be but a small objection

having the sight between them; but as guns are commonly made, the thickness between the bores of each, at the breech, is three-sixteenths of an inch, and at the muzzle one-sixteenth. Therefore, if the length of a pair of barrels was two feet six inches, which is the ordinary length, and the sight taken from the centre, and a ball was projected from one of them, it would make one-eighth of an inch declination from its true course in every two feet six inches it had to travel, which would make, in forty yards, a declination of *six inches*. From this cause, the right-hand barrel always shoots to the left, and *vice versâ*. Now, to remedy this, suppose the thickness between the two barrels to be at the breech three-sixteenths of an inch, then let the space at the muzzle be the same; and where the barrels are thus laid together, and the sight placed between them, the ball would only make a declination of half an inch (the bore being five-eighths of an inch), being the distance between the centre of the barrel-bore and the exterior of the barrel's surface." The method by which this error is attempted to be rectified, by filing away so much of the breech-surface as shall bring the calibers of the barrels into a more rectilinear direction, is considered nothing more than remedying one defect by creating another. The great object should be to effect the junction of the gun-barrels, in such a manner as to bring the centres of the calibres of the muzzles, and the centres of the calibres of the breeches, if not exactly equidistant, at least much more so than is commonly effected; the approximation being in general in the direct ratio to the length of the barrels.

The late Colonel Hawker treats this subject with some degree of indifference; and Mr. Blaine dissents from the line of argument pursued by Mr. Greener regarding it. "Much as we admire Mr. Greener's usual line of argument," says Mr. Blaine, "we regret that on this subject we disagree with him, also, when he says—'To make them (the barrels) uniform (*i. e.*, lessen the convergence we complain of), it requires that they be reduced, or flattened, to allow the thick or heavy end to join closer.' If this be not incurring a risk, we do not know what is; and we do hope that no respectable gun-maker will rectify his convergency in the barrels towards each other by any other means than firmly setting the centres of the muzzles rectilinearly with those of the breeches, by the agency of an intervening substance, as hard soldering in the centre, mettle-ribbing it above and below; and then, and then only, the silver sight will not be a guide to error."

ELEVATION AND ELEVATED RIB.

What should be the *elevation* and the *elevated rib* of a gun, involve nice and abstruse questions as to the precise movements of bodies thrown out of projectiles generally. The line which a charge of shot takes when fired from a double gun, is called, in gunnery, the *line of impulse*. Whether it be *rectilinear* or *curvilinear* is still a point of dispute. But one thing is certain, that the shot is under the influence of the ordinary and the universal law of gravitation, which acts upon it so as to bring it within the universal law of having a tendency to fall to the ground. The distance to which its flight may be prolonged, depends on the excellence and make of the gun, the materials with which it may be loaded, and the various minute matters which constitute the tact, aim, &c., of the person using the instrument. A curvilinear direction of the shot is assumed, as a fact, by gun-makers; and their grand object is, to bring the shot to the mark aimed at by the use of mechanical means—such as straight stock, or an artificial elevation of the muzzle of the piece, in proportion to the length of the barrel. All these points certainly appertain more to the express business of the gunsmith; yet the sportsman should know something of them, as they bear directly upon practical results necessary to his own safety.

On the *Elevated Rib*, Colonel Hawker and Mr. Greener have written at some length. Their opinions are entitled to great weight, and they maintain that different lengths of barrel require a corresponding height of the rib; and that a greater height is required by a person accustomed to use a crooked stock, and *vice versâ*. Both writers, likewise, maintain that the elevation of the rib commonly met with is not sufficient. The usual elevations do not deliver the shot, even at forty yards, with a usual charge of powder; and where the shot is of more than average size, there must be a great defalcation in the result. Mr. Greener says, that the experiment he has

made, shows that, in heavy charges of shot, the droop is fully *twelve inches in forty yards*; but that with less charges of shot, the line of flight will be more direct.

The great advantage of the double-barrelled gun over the single one is now generally admitted by all sportsmen; but there are still some shooters to be found who prefer the latter. This preference, however, depends, in almost all cases, upon some accidental circumstance, or individual fancy. The quantity of game to be obtained, especially in the earlier parts of the shooting season, is much more with a double than with a single gun. The weight is generally greater in the former than in the latter; but habit and custom soon bring the matter to an equality on this point.

On the calibre, or bore, the length and weight of barrels, their killing range, their recoil, the regularity of their effect, their force, their liability to burst, much might be written; for on all these several subjects there have been, and still are, considerable differences of opinion. It is unnecessary for us here to enter into full details regarding them. They are of more interest to the scientific maker than to the sportsman, whose experience soon teaches him as to what sort of weapon he finds to be the best to enhance his pleasure or amusement.

CALIBRE, OR BORE.

It is recommended by a high authority that *flint-guns* should not be bored cylindrically through, but that a little contraction, just where the shot first moves, should be preserved. This suggestion has, for many years, been pretty generally attended to by gunsmiths. It is of importance that every purchaser of a fowling-piece should ascertain, by the gauge, the exact diameter of each portion of the bore of the piece, that he may adapt his wadding accordingly. The proper wadding for such kind of relieved barrels is that which has some considerable degree of firmness, with a certain portion of elasticity. Beckworth's wadding is of this kind. There are, however, many barrels now made which are bored cylindrically throughout; and it is affirmed, by competent authorities, that such pieces shoot remarkably well.

PERCUSSION BARRELS.

These are commonly made heavier and stronger than the barrels of the flint-gun. It is now the practice to bore such barrels with a little relief forward, which, Colonel Hawker maintains, "has the effect of making the gun shoot as close as it can do, compatible with the quickness and strength required." The increased weight of the percussion-barrel has, however, been objected to by others, whose opinion upon this subject is entitled to much weight.

LENGTH AND WEIGHT OF BARRELS.

There has been a great innovation upon the length of gun-barrels. It was long considered to be an indisputable maxim, that the longer the barrel, and the smaller the bore, the farther a gun would kill. Now, however, the barrel is considerably shortened, and with good results. Here again, however, some sportsmen think an error has been made in running into the opposite extreme, and making them too short. Mr. Robins, who seems to have paid great attention to this matter, says, "that the sportsmen may please themselves whether the length of their barrels be from *twenty-eight* to *forty* inches; but that if they either go above or below these dimensions, they will find that the range of the shot will begin to fail them." We would say, that at present, the general opinion is in favour of moderate length of barrel. Such fowling-pieces are decidedly better adapted for general purposes, more portable, and are freer from many inconveniences attendant upon very long guns. The *Oakleigh Shooting Code* gives the following judgment on the matter:—"The fowling-piece to be recommended for general use is a double-barrelled detonator, weighing about eight pounds; the barrels thirty or thirty-two inches in length, sixteen gauge, and made of twisted stubs. It is not sportsmanlike to use double barrels of a greater calibre; nor are longer barrels convenient, on account of their weight, although additional length, not carried to an extreme, or a larger calibre, may probably render them more effective, in so far as they will sustain a heavier charge. Single barrels, for general use, may be *thirty-four* inches long and *fourteen* gauge." The same authority says, that "the barrels of the

grousing gun should be thirty-two inches long, and sixteen gauge; a single barrel for grouse-shooting should be thirty-six inches long, and fourteen or fifteen gauge. If selected for partridge-shooting only, the barrels should be thirty inches long, and sixteen gauge; or a single barrel thirty-four inches, and fourteen or fifteen gauge. If selected for cover-shooting only, the barrels should be only twenty-eight inches, by sixteen gauge; or single barrels thirty-two inches, and fifteen gauge."

EXTENT OF RANGE.

On this subject there is much variety of opinion; and that, too, amongst sportsmen of great experience, and thoroughly practical in the knowledge they possess. It is, therefore, impossible for us to decide a problem so much involved in difficulty. Two points should be obtained by all guns—to keep the shot from being scattered, and to give them the greatest amount of *force* or *propulsion*. These are the *ends* desired; but the means best calculated to obtain these, have given rise to numerous and conflicting theories and expedients. Some think that the muzzle of the gun should be a little widened; some advise the mixing of oil and water with the shot; and some place all their faith in well-regulated charges of powder. There are advantages attending all these methods, but not to the extent which their respective advocates maintain. The distance of range that most fowling-pieces will carry, on ordinary occasions, is *forty yards*. This is considered a fair average shot. Some, of course, will kill considerably further, and some not so far. Mr. Daniel, in his *Rural Sports*, observes, that "there are few things in which persons have more faith than in the excellence of their own gun; the distance at which it kills, and the closeness with which it throws the shot, are inconceivable. Striking a card, with ten or twenty grains of shot, at sixty yards, is nothing uncommon; and the merits of the shooter and his gun bid defiance to rivalship. It is no easy matter to change the opinions of such persons respecting their guns; but when a gun is said to be sure at threescore or fourscore yards, the measure may be safely asserted to be of the proprietor's own making. The circumstance of knocking down a partridge at eighty yards may happen; but very few barrels of those that are generally used for the shooting of birds on wing, will throw shot compact enough to be certain of killing at fifty yards; one or two grains of shot are not sufficient so to strike a bird as to bring it to the ground; for when stript of its feathers, a partridge is a much smaller object than it appears to be, and possesses many parts not vital. Those who expect light barrels, of three feet or three feet six inches, to throw shot close enough to insure a small object at fifty or sixty yards, will be exceedingly mistaken."

From general observation, it will be found that from twenty-five to thirty yards is about the average distance at which nine out of ten of all birds are killed. Many are wounded nay, even killed dead, at forty, fifty, and even sixty; but it is clear that these are but solitary cases, and are chiefly the effects of mere chance, or random shots.

THE RECOIL OF A GUN.

All guns have a greater or less recoil, proceeding from the mechanical principle, that all force begets force. Inequalities of their bore, contractions at their breeches, the too great quantities of powder or shot used, dampness and confined air, &c., &c., are the commonly prevailing causes of guns recoiling unpleasantly. Even the material and peculiar construction of the weapon lend their aid to produce the same effect.

BURSTING OF GUN-BARRELS.

We sometimes hear of the bursting of barrels which have been made by the first manufacturers in the kingdom. These accidents often depend upon causes hidden from observation, and, consequently, little known. They are, however, sometimes lamentable in their consequences, and demand the constant attention of the sportsman to be upon his guard against the occurrence. The selfsame causes which produce great recoils in a gun, may make it burst. The recoil and the bursting differ only in degree and intensity. Overloading a piece; immersing its muzzle under water, and firing it off; leaving a ramrod in the barrel, and firing it off with it, and many other acts may produce this effect. There is no recipe to be given that will supersede attention and care

to the various matters which are fully stated to the sportsman in most works specially devoted to the gun.

THE LOCK.

The manufacture of this part of the fowling-piece has been carried to great perfection in England, especially within the last thirty years; notwithstanding that the first spring-locks were made at Nuremburg, in Germany, about the middle of the sixteenth century. The inventor, and general manufacturer of them, is said to have realised an independent fortune from the success with which his invention was received. By degrees, he succeeded in making many alterations and improvements on his first model; and his son, who carried on the business for nearly half a century after his death, introduced still more decided improvements in its construction.

The *Flint-lock* must now be spoken of as an instrument of the past, as, except in the most primitive districts of countries, it is scarcely to be found. The invention of the *Percussion-lock* has completely supplanted its use. It is, perhaps, a somewhat curious fact in the history of a sporting and a military weapon, that this one was the invention of a reverend gentleman, of the name of Forsyth. His patent expired in 1821, since which it has been very much improved.

BREECH-LOADERS.

Until recently most guns were loaded from the muzzle, whereas now they are loaded at the breech. Of the different applications of scientific skill to the manufacture of this weapon, the following may be viewed as the principal.

1. Those in which a cartridge, with the powder and ball enclosed in some thin envelope, is pushed into the chamber of the barrel from behind, which is then closed, and the powder is exploded by a stream of gas from a cap perforating the walls of its case. 2. Those in which a thicker case of paper and metal, or metal alone, containing within it some substance explosive on percussion or friction, is filled with powder and ball, and pushed into the chamber from behind. This is then closed, and the explosion effected by a needle or pin being driven into the case, which is then withdrawn, leaving the chamber clear of all wads and other remnants of the discharge, except the fouling of the barrel caused by the residuum from the explosion of the powder. 3. Those in which the barrel is divided *in front* of the charge, which is placed in the hindmost portion of it, in the same order as if the loading was from the muzzle; after which the chamber is replaced. Here, if powder and ball are carefully inserted, good shooting can be effected; but then the loading is quite as slow as in the muzzle-loader; while, if a cartridge is used, some parts of the envelope are left behind, and miss-fires, accidental explosions in loading, and bad shooting, are the frequent result.

Perfect, however, as these instruments may be considered in a scientific point of view, recent events in the war between Austria on the one side, and Prussia and Italy on the other, have effectually proved that, on the continent at least, there is another, possessed of certain properties, which, when used with skill, may be said to have already overturned all previous theories respecting the arbitrament of arms in the battle-field. We allude to the PRUSSIAN NEEDLE-GUN. The effect of this weapon, in deciding the late conflict between those powers, might, when judged by statistics, be considered as almost miraculous. In the summer of 1866, Prussia, long in a state of high military preparation, waged war with Austria, and, in a very brief period of time, succeeded in establishing her supremacy in Germany. In the conflict Austria is estimated to have lost 120,000 men in prisoners, wounded, and killed—90,000 against Prussia, and 30,000 against Italy. The Prussian loss, during the war of 1866, was officially reported at 19,875 men, exclusive of those who died of their wounds and from disease; the number killed in battle being under 4,000. The military and newspaper correspondents who visited the fatal field of Sadowa, were unanimous in declaring the vast excess of killed and wounded on the side of Austria. At the final exchange of prisoners, in August, there were released, by Prussia, 523 Austrian officers, and 35,036 rank and file, exclusive of about 13,000 Austrian prisoners in the hospitals, and not fit for removal. Austria gave up to Prussia seven Prussian officers, and 450 non-

commissioned officers and men; about 120 prisoners, from their wounds, unfit to be removed, remained in Austria. These returns, which are, no doubt, approximately correct, speak volumes as to the science and art of war. They have been everywhere understood; and the military monarchies throughout Europe are reorganising their armies, and arming them with the needle-gun, or some equally or more effective weapon. Prussia, as the leader of 40,000,000 of Germans, having a seaboard on the Baltic, is a very different power from the Prussia of even ten years back. What the probable effect may be in Europe it is not necessary now to consider. Still, there can be no doubt that it will be (if it is not now the time) very necessary for every European state to adopt the best means which may be in its power to place itself in an attitude of defence. The rapidity with which scientific skill, in the art of war, is daily developing itself, proves this advice not to be mistimed; we therefore offer it from a consideration of its usefulness, as well as from the hope that it may rather prevent than promote the destruction of our species.

THE GUN-STOCK.

This is an important part of the fowling-piece. In fixing upon the length, bend, and cutting of the stock, there has been much nicety laid down for the guidance os gun-makers. Colonel Hawker maintains, that the framing of a stock of a gun should vary with the precise make of the man who has to use it. It should be fitted to the shooter, who should have his measure for its several parts as formally entered into the gunsmith's books as a man has in a tailor's for a suit of clothes. Some manufacturers have a machine, or *stock gauge*, by which they measure the outlines of their customers as regards their length of arm, neck, &c., so as to furnish each man with a gun-stock that will agree with his peculiar bodily conformation. This has something like common sense to recommend it. It has been justly observed, that there is full as much skill required to fit a man with a gun-stock, in agreement with his make, as there is to fit a dandy with a complete suit of clothes.

Besides the parts which we have described, there are others belonging to a gun, of which it is necessary for the sportsman to have some knowledge. It is not essential, however, to describe them with the same degree of fulness which we have given to the preceding portions.

OTHER PARTS OF A GUN.

Bolts.—Irons which enter the loops or eyes of the barrel to fasten it to the stock.

Bridle.—A polished piece of steel which caps the tumbler, and is secured by two screws. It likewise receives the scear-screw.

Butt of Stock.—The shouldered extremity of the stock.

Cap.—It covers the ramrod screw-cap, and is also used for the tip of the stock.

Casting off.—The outward inclination given to the butt-end of the gun being intended to incline the line of aim inwards.

Chain or Swivel.—A small catch suspended from the neck of the tumbler, to receive the extremity of the mainspring.

Chamber.—The central cavity within the breech, to receive the powder. The *ante-chamber* is the small one which connects these with the touch-hole.

Cock.—In the flint-gun it holds in its jaws the flint; in the percussion-gun it is equally a cock, but there it is more frequently called the *striker*.

Cock-screw.—The screw that brings the jaws of the cock together.

Cup.—The cavity seen at the top of many of the improved breechings.

Escutcheons.—Ornamental pieces of silver to prevent the bolts from defacing the stock when the turnscrew and pincers are applied. Escutcheons are likewise used on other parts to receive initials, crests, shields, &c.

False Breech.—This receives the *butt* or nose of the breech when the barrel is fastened into the stock.

Elevated Breech or Rib.—This is a top piece much elevated, first used by Mr. Joseph Manton.

Fence.—The part between the cock and the pan which receives the solid stock.

Guard.—The bow which defends the trigger.

Hammer-spring.—That on which the hammer moves.

Hammer-bridle.—The part in which the tail of the hammer works.

Heel-plate.—The plate with which the heel of the stock is tipped.

Jaws.—The lips of the cock which holds the flint.

Lock-plate.—This supports the principal works of the lock.

Main-spring.—The spring by which the tumbler is worked with the cock.

Nipple or Pivot.—The small iron pillar that receives the copper cap of the detonator.

Pipes.—Tubes to receive the ramrod.

Rib.—A central piece of iron which unites the barrels and receives the ramrod.

Scroll-guard.—An extension of the guard which receives the right-hand in fixing the gun.

Scear.—That which catches the tumbler for half or whole-cock, and being pushed up by the trigger.

Scear-spring.—The spring which holds the scear in the notches of the tumbler at either half or whole-cock.

Side-nail.—A screw which fastens on the lock.

Sight.—A patch of metal, usually of silver, placed near the gun-barrel, to direct the aim.

Spring-cramp.—A useful instrument, to assist both in taking to pieces and putting together the parts of the lock.

Tail.—The neck, shoulder, or arch of the hammer.

Top-piece.—This opposes the rib which unites the lower arches of the barrel. When it is very prominent behind, it is called the *elevated* rib.

Trigger-plate.—The trigger works in it.

Trigger-springs.—Are small springs found in some highly-finished locks, and are intended to keep the triggers close to the screw.

Tumbler.—The movable centre-piece of a lock which falls with, and is subservient to, the cock.

Tumbler-screw.—This fastens on the cock.

Vent-hole.—Sometimes there are two or three vent-holes, which are intended to let out the gas in a detonator, and thus to lessen the recoil.

Worm.—The screw at the end of the ramrod.

Every sportsman should look to his own gun, as it is he who is to use it, and as it is to him that an accident is most likely to happen, should it not be in proper order for shooting. There are few who have had an extensive acquaintance with guns, who are not aware of the carelessness and negligence of many servants in getting a gun into proper order, even for their master's use.

All fowling-guns require to be taken completely to pieces at stated times, to be thoroughly examined, and every part of them put into such a state as to render them fit for use at any moment. Twice a year is considered not too often to look into their every crevice, taking most especial care to overlook nothing —not even the smallest screw or spring. To do this work well, the sportsman should supply himself with a bench, vice, turnscrews of various dimensions, from an eighth to half an inch; the latter size being required for the cork-screw, breech-screws, and for raising the bolts which bind the barrel to the stock. The spring-cramp is a necessary article in this matter of overhauling the entire fabric of a fowling-piece. When a sportsman does not reside in the immediate vicinity of an experienced gunsmith, he ought to have by him duplicates of all the necessary parts of his instrument, that he may be able to supply himself, on all contingencies, with what may be requisite to keep it in working order.

CLEANSING OF GUNS.

The following instructions, altered from the *Encyclopædia of Rural Sports*, are well worth remembering:—

In taking off the *main-spring*, let the lock be placed on full-cock; then cramp the main-spring; when this is effected, let down the cock, and the main-spring will fall off. When the lock has again to be fitted in, let the cock be left down; then hook the end of the main-spring on the swivel or chain; move it up, and place it into a position on the lock-plate. When this is done, unscrew the cramp, and the lock is once more fit for use. When the hammer has to be taken off, first shut it down carefully; cramp the spring until, by shaking the lock, the hammer is heard to rattle. Stopping here, take out the screw behind, and the hammer will fall off. The replacing of it only requires the putting it in its former situation, turning the screw, and setting the spring at liberty. If it be requisite to take the hammer-spring out, the hammer must first be released, and the main-spring likewise, in order to get at the screw behind. The hammer-spring must then be cramped, till it is taken out and put on again to receive the hammer.

To take to pieces all the small springs of the lock, requires considerable care. The several screws must be kept distinct; and any little mistake in this matter may produce serious results. When the main-spring is taken off, unscrew and take out the scear, by half cocking the lock. Clasp the fore part of the lock firmly; at the same time press the thumb against the back part of the cock, directing it forward; while the scear, and scear-spring, being now pressed together by the fore-finger and thumb, will readily enable the operator to take out the scear-screw. When this is done, undo the two screws, take off the bridle, and then unscrew and take out the scear-spring. The cock must next be unscrewed, which will readily separate from the tumbler, if it be gently shaken or tapped. Take out the tumbler, and the lock is separated into its component parts.

When it has to be reconstructed, put the tumbler in its place, and screw on the cock; do the same thing with the scear-spring, and set on the bridle with the two upper screws. Put in the scear; but in order to open a clear passage for the screw of the scear, see that you again, as before, press the fore-finger and thumb on the scear and scear-spring, and likewise that you again push the cock forward as when in the act of taking off the scear. Unless there be a pressure of this kind, it is not easy to place the hole of the scear opposite the hole of the bridle; and without this is effected the scear-screw will not enter. Great trouble often ensues from want of attention to this and other trifling points. After this, the cock must be let down to admit of putting on the main-spring; and then the process is finished.

In a detonating gun there is not near the same amount of trouble in dismembering the fowling-piece. The pivot, or nipple, should be now and then removed, and carefully examined, that the

first approaches of corrosion may be taken off before any injury is inflicted. When a gun is purchased, it ought to be provided with spare pivots, all mathematically adjusted to the barrel. It is likewise a good practice to put a little olive-oil, with a camel's-hair pencil, on the pivot nail, or centre of the tumbler, on which almost all the works of both flint and percussion-guns move. The same may be applied, with advantage, to the lock-plate under the works. In flint-guns, a little oil under the hammer is likewise useful, Mr. Lankester, in his printed directions given to gentlemen who buy percussion guns, offers the following directions :— "Always clean those parts of the barrels and locks that the detonating powder acts upon, with a wet rag ; then rub them dry, and leave them in oil to prevent rust. The pegs should not be taken out too often. Before you take out the barrels, bring the locks to half-cock. The locks do not require to be taken off every time the gun is used ; once a fortnight is quite sufficient. Put a little fine oil to the parts where there is friction ; but if the gun has been used on a wet day, the locks should be taken off to be cleaned, and oiled immediately." When, by accident or neglect, a lock becomes completely rusty, both within and without, it ought to be plunged into warm water, and well scrubbed with a hard brush, fine sand, emery powder, or levigated glass. The rust will, by this means, be effectually removed, and will not injure the gun, providing it is but a recent accumulation of rust ; but if it is of long standing, it may have eaten into the core of the metal, and produced vital injury.

Most men have peculiar methods of their own for keeping their fowling-pieces clean ; and though all employ the leading, or primary elements of cleanliness, yet they differ as to their precise application. On a point so apparently simple, it is astonishing to find so many opposite plans, and many of them enforced with a dogmatism and obstinacy far beyond what one would imagine the importance of the subject warrants. The following, among many other methods, is chosen, because it has been found always to answer the desired end :— Provide some boiling water and an empty pail ; detach the barrel from the stock, and with a clearing-rod furnished with tow, begin to pour the hot water down each barrel. Scour it well with the clearing-rod, and discharge the barrel of the foul water. Pour hot water into it a second time, and wipe out the barrels with fresh tow, until they are completely dry, both without and within. Should there be any moisture lurking within the screw-joints of the breech and touch-hole, it is a good plan to let down an iron plug, of red-heat, which, being moved up and down the barrel or barrels for half a minute, will effectually absorb every particle of moisture or damp. All this should be done with the sportman's own hand ; and not, if it can be avoided, left to another person to do. There is an old maxim which applies to gun-preserving very forcibly :—"What a man wishes to have well done, he should do himself."

Mr. Lankester's directions run thus :—

Place the breech ends of the barrels in a bucket in which there is cold water, about three inches deep ; then, after wetting the sponge, cloth, or tow, introduce the rod into the barrels, and work it well ; next apply the wire-brush attached to the clearing-rod with some clean hot water, which will take out all the lead in the operation. This should be invariably attended to, as it is well known that washing only will not remove the lead. Wipe the rod and the outside of the barrels dry, and set the latter upright, muzzle downwards, for two minutes, to drain, after which rub them out perfectly dry. Wipe the barrels out clean, then pass an oiled rag down the inside, and rub over the outside ; leave them a little oily, which will prevent rust. The use of cloth is preferred, as not subjecting gentlemen to the serious accidents that have happened from leaving tow in the chamber. But, brass being in its nature softer than iron, allows of the brush being used without the possibility of injury to the barrels.

How often a gun should be cleaned must depend upon many circumstances, as there is a wonderful difference of guns in accumulating dirt. This arises, perhaps, from their different degrees of internal finish. Then, again, some kinds are foul with powder more than others ; and small shot fouls them more readily than large. Waddings, too, have an effect ; some kinds keeping the gun comparatively clean much longer than other kinds. It is commonly maintained by practical shooters, that a barrel should be cleaned after the firing of *twenty shots*. But there can be no invariable rule laid down for this. A man who is careful, who understands what a gun is, and who knows the peculiarities of the one he is in the habit of daily using, cannot err very far from the right path in this matter. It is always safe to be over-anxious rather than otherwise on a point of such great importance.

To remove rust from the inside of the barrel, some sportsmen recommend an ashen rod, turned a few inches longer than the barrel, and so nearly of the size of the bore, as to allow of the following process :—Let one end of the rod be cut lengthwise, so as to make a slit of six inches long, into which slit enter as much of fine emery paper as will completely fill up the bore of the barrel, taking care, in folding the paper tightly round the wood, that the emery surface is outward. Force it into the barrel by screwing it downwards from the top to the bottom ; and repeat the process until the barrel is as clean and as polished as when it left the maker's hands. No sand or coarse stuff of any kind should be used.

It is of great moment that every sportsman, when he comes home, or goes into any house whatever, should keep a watchful eye on his fowling-piece. He ought always to displace the cap, and throw out the priming. But even this does not always secure an immunity from fatal accidents. A few stray grains of powder may still be productive of an explosion. It is therefore a wise plan, when a shooter arrives at a door, to remove the cap, if a percussion-gun ; or if flint, throw out the priming, let down the spring of the lock, draw the ramrod, and dropping down the barrel, put the gun away into a closet, or otherwise suspend it out of ordinary reach. Too much care cannot be exercised in a matter of this kind. How often have we heard

of families having been thrown into the utmost state of grief by a son or a daughter being unintentionally shot in a moment of playfulness, by some other minor member of the family. How often have we read of accidents of this kind, and sympathised with the living as they mourned over the sudden deprivation which had fallen upon them. When we reflect on these sad calamities, it makes us entreat of every sportsman or shooter, never to carry a loaded gun into the house, but to fire it off in the air, even before he has arrived at the close neighbourhood of his own dwelling. Mr. Blaine objects to this, partly on the score of economy—an objection which appears to us alike mean and frivolous.

POWDER AND SHOT.

There is no discovery which effected a greater revolution in the art of war than that of gunpowder; for when taken in connection with the weapon by which it is used, it may be considered as the most effective decider of conflicts that possibly could be invented. Both on the battle plain, and in the sporting field, it has taken the place of the more simple construction of the bow and arrow, which, however annoying to an enemy in the hands of a practised archer, or however deadly in those of an Indian sportsman, bears no comparison, in the certainty of its effects, to the modern gun, loaded with powder and ball, or shot. The origin of this explosive substance has given rise to long discussions, and great diversity of opinion, among philosophers and antiquaries. Some have given it a very ancient date, while others carry its discovery down to comparatively recent times. Grose quotes a passage from Grey's *Gunnery*, published in 1731; in which it is said that, "In the life of Apollonius Tyanæus, written by Philostratus, about 1,500 years ago, there is the following passage concerning the people of India, called Oxydracæ: 'These wise men dwelt between the rivers Hyphasis and Ganges. Their country Alexander the Great never entered; deterred, not by fear of the inhabitants, but, as I suppose, by religious considerations; for, had he passed the Hyphasis, he might doubtless have made himself master of the country all around them; but their cities he could never have taken, though he had led a thousand men as brave as Achilles, or three thousand such as Ajax, to the assault; for they came not into the field to fight those who attack them; but these holy men, beloved by the gods, overthrew their enemies with tempests and thunderbolts, hurled upon them from above.'" In Norton's *Gunner* (1664), it is said—"That the invention and use, as well of ordnance as gunpowder, was, in the *eighty-fifth* year of our Lord, made known and practised in the great and ingenious kingdom of China; and that in the maritime provinces thereof there yet remain certain pieces of ordnance, both of iron and brass, with the memory of their years of founding engraved upon them, and the arms of King Vitney, who, he saith, was the inventor." In the works of Roger Bacon, written at Oxford, in 1270, the ingredients which constitute gunpowder are expressly named, with the characteristics which mark it when it is exploded.

On the other side of the question it is maintained, that the merit of the invention belongs to Barthold Schwartz, a German monk. It is affirmed, that he mixed together nitre, sulphur, and charcoal, for some medicinal purpose, and a spark falling accidentally upon the mixture, it exploded. The reader will find the subject discussed at considerable length in the works of Friar Bacon, Polydore Virgil, Baptista Porta, Spondanus, Bishop Watson, and others.

It is well known that gunpowder consists of a mixture of saltpetre, sulphur, and charcoal, in such proportions as to render it capable of explosion on the slightest application of fire. It has, however, a great tendency to absorb moisture; and should the nitre be adulterated with salt, as it sometimes is, this tendency is immensely increased. An experiment made before the Royal Society proved this. A quantity of gunpowder was taken out of a barrel, and dried with a heat equal to that in which water boils. A piece of ordnance was charged with a certain weight of this dried powder, and the distance to which it threw a ball was marked. The same piece was charged with an equal weight of the same kind of powder, taken out of the same barrel, but not dried, and it threw an equal ball only to one half the distance. This effect of moisture is so sensible, that some officers have affirmed, that they have seen masses of gunpowder, which were good in the morning, but which became (as supposed by attracting the

humidity of the atmosphere) good for nothing in the evening. This recalls to mind the remark of Cromwell, when about to engage with the cavaliers—"Praise the Lord, but keep your powder dry." He seems to have been aware of the absorption of moisture inherent in the material he was about to use with considerable effect against his enemies.

The chemical properties of gunpowder are thus decribed by the celebrated Dr. Ure:—"This explosive substance consists of an intimate mixture, in determined proportions, of saltpetre, charcoal, and sulphur; and is better in proportion (everything else being equal) to the quality of these ingredients. The nitre, in particular, should be perfectly refined by successive crystallisations, and finally freed from adhered water, by proper drying, or by fusion in iron pots at a regulated heat. Nothing can surpass, in these respects, the nitre prepared in the government powder-mills at Waltham Abbey. It is tested by adding to its solution, in distilled water, nitrate of silver, with which it occasions no perceptible opalescence. The sulphur ought, also, to be of the finest quality, and purified by skimming, or even sublimation, if at all necessary. The charcoal should be newly made; it should burn without leaving any sensible residuum; be dry, sonorous, light, and easily pulverised. The charcoal for gunpowder is made either of alder, willow, or dogwood, the latter being preferred, which is cut into lengths, and ignited in iron cylinders, the wood before charring being carefully stripped of its bark. The three ingredients being thus prepared, are ready for manufacturing into gunpowder. They are first separately ground to a fine powder, which is passed through proper sieves or bolting machines; secondly, they are mixed together in certain proportions, but which do not seem to be definitely determined, for they differ in different establishments of great respectability, as is shown in the following table:—

	Nitre.	Charcoal.	Sulphur.
Royal Mills at Waltham Abbey	75	15	10
French for War	75	12·5	12·5
Do. for Sportsmen. . .	78	12	10
Do. for Mining . . .	65	15	20
Chaptal's Proportions . .	77	14	9
Chinese do. . . .	75·4	14·4	9·9
Mr. Napier's	80	15	5

Thirdly, the composition is then sent to the gunpowder-mill, which consists of two edge-stones of a calcareous nature, turning by means of a shaft on a bedstone of the same nature, which gives no sparks, as sandstones would be apt to do. On this bedstone the composition is spread, and moistened with as small a quantity of water as will, in conjunction with the weight of the revolving stones, bring it into a proper body of *cake*, but not of *paste*. When the cake has been thoroughly incorporated, it is sent to the corning-house, where a separate mill is employed to form the cake into grains of corn. Fourthly: here it is first pressed into a hard firm mass, then broken into small lumps; after which the graining is executed by placing these lumps in sieves, on each of which is laid a disc of *lignum vitæ*. The sieves are made of parchment skins perforated with numerous round holes. Several such sieves are fixed in a frame, which, by proper machinery, has such a motion given to it as to make the *lignum vitæ* runner in each sieve move round with considerable velocity, so as to break the lumps of the cake, and force the substance through the sieves, forming grains of several sizes. The granular particles are afterwards separated from the finer dust by proper sieves and reels. Fifthly: the corned powder is next hardened, and the rougher edges taken off by being revolved in a close reel or cask, turning rapidly on its axis. This vessel somewhat resembles a barrel churn; it should be only half full at each operation, and has frequently square bars inside, parallel to its axis, to aid the polish by the attrition. Sixthly: the gunpowder is now dried, which is done generally by a steam heat, or by transmitting a body of air, slightly heated in another chamber over canvas shelves, covered with the damp gunpowder."

We have taken this extract from the *Chemical Dictionary*, where, in an article on gunpowder, the reader will find much interesting information on the *rationale* of the action of gunpowder, in regard to both its detonating and combustible powers.

As to the relative size of the grains of powder to be used in sporting amusements, there is a considerable diversity of opinion; some affirming one size to be the best, and some another. This question cannot be definitely settled without taking into account the nature of our guns, the purposes for which they are made,

the kind of game to be shot, and many other circumstances, all, more or less, calculated to modify the judgment, and to cause it to preponderate either to the one side or the other. Mr. Greener maintains that, if we obtain powder of fine grain, and powder composed of the same ingredients, large-grained, the latter will be stronger than the former. He tells us he has made many experiments both by rifle and musket, and the coarser grain always predominated over the smaller. These results have been denied by other respectable sporting authorities. Colonel Hawker says, the best powder for copper-cap guns is the *fine* cylinder of Curtis and Hervey, the large-grained powder being liable to miss fire. But the same authority qualifies his opinion by afterwards stating—"I have invariably observed that small-grained powder fails to answer in large guns; particularly on salt water, and in damp weather. It always shoots weak beyond fifty or sixty yards, and is very liable to hang fire. If a punt-gun is loaded with fine powder, and brought in at night, the chances are that it would hang fire in the morning. But with coarse cannon powder, I have known a gun that has been loaded for a fortnight go off as well as possible, by merely being probed, and fresh primed."

How far the *glazing of powder* is advantageous, is likewise a disputed question. Many sportsmen affirm, that they fail to detect any difference between the glazed and the unglazed kinds. Colonel Hawker prefers the unglazed; but he assigns no reason for this preference: the whole question probably resolves itself into a mere matter of fancy or taste.

On the ratio of force with which different kinds of powder act on resisting bodies, much curious and valuable information has been communicated to the world of late years. The substance of such information we shall attempt to condense into as brief a space as is compatible with clearness.

As Mr. Babbage, in his *Economy of Machinery*, favours us with remarks pertinent to this subject, we are glad to give the reader the benefit of them, as his work is not likely to be widely diffused amongst those who follow the gun as an amusement.

A gun loaded with ball, does not kick so severely as one loaded with shot; and among the different sorts of shot, that which is the smallest, causes the greatest recoil against the shoulder. A gun loaded with a quantity of sand, equal in weight to a charge of snipe-shot, is said to kick still more. If, in loading, a space be left between the wadding and the charge, the gun either recoils violently or bursts. If the muzzle of a gun has accidentally been stuck into the ground, so as to be stopped up with clay, or even with snow, or if it be fired with its muzzle plunged into water, it will, in all probability, burst. The cause of these apparently contradictory results is, that every force requires *time* to produce its effects; and if the *time* requisite for the elastic vapour within to force out the sides of the barrel, is less than that in which the condensation of the air, near the wadding, is conveyed in sufficient force to drive the impediment from the muzzle, then the barrel must burst. It occasionally happens that these two forces are so equally balanced, that the barrel only swells, the obstacle giving way before the piece actually bursts. This explanation will appear more obvious if we trace, step by step, the circumstances which arise on discharging a gun loaded with powder, confined by a cylindrical piece of wadding, and having its muzzle filled with clay, or some other substance, offering a moderate degree of resistance. In such a case, the first effect of the explosion is to produce an enormous pressure on everything confining it, and to advance the wadding through a very small space. Here let us consider it as at rest for a moment, and examine its condition. The portion of air in immediate contact with the wadding is condensed; and if the wadding were to remain at rest, the air, throughout the tube, would soon acquire a uniform density. But this would require a small interval of time, for the condensation next the wadding would travel with the velocity of sound to the other end, from whence, being reflected back, a series of waves would be generated, which, aided by the friction of the tube, would ultimately destroy the motion. But, until the first wave reaches the impediment at the muzzle, the air can exert no pressure against it. Now, if the velocity communicated to the wadding is very much greater than that of sound, the conden-

sation of the air, immediately in advance of it, may be very great before the resistance transmitted to the muzzle is at all considerable; in which case the mutual repulsion of the particles of the air so compressed will offer an absolute barrier to the advance of the wadding. If this explanation be correct, additional recoil, when a gun is loaded with small shot or sand, may arise, in some measure, from the condensation of the air contained between their particles, but chiefly from the velocity communicated by the explosion to those particles of the substances in immediate contact with the powder, being greater than that with which a wave can be transmitted through them. It otherwise affords a reason for the success usually attending the blasting of rocks. That the destruction of the gun-barrel does not arise from the property possessed by fluids, and in some measure also by sand and small shot, of pressing equally in all directions, and thus exciting a force against a large portion of the interior surface, seems to be proved by a circumstance mentioned by La Vaillant and other travellers —that for the purpose of taking birds without injuring their plumage, they filled the barrel of their fowling-pieces with water, instead of loading them with a charge of shot. The same reasoning explains a curious phenomenon which occurs in firing a still more powerfully explosive substance. If we put a small quantity of fulminating silver upon the face of an anvil, and strike it slightly with a hammer, it explodes; but, instead of breaking either the hammer or the anvil, it is found that that part of the face of each in contact with the fulminating silver is damaged. In this case, the velocity communicated by the elastic matter disengaged may be greater than the velocity of a wave traversing steel; so that the particles at the surface are driven, by the explosion, so near to those next adjacent, that when the compelled force is removed, the repulsion of the particles within the mass, drives back those nearer the surface with such force, that they pass beyond the limits of attraction, and are separated in the shape of powder. The success of the experiment of firing a tallow candle through a deal board would be explained in the same manner, by supposing the velocity of a wave propagated through deal, to be greater than that of a wave passing through tallow.

Experiments to try the strength of their powder have often been made by sportsmen; but the excellence of powder is generally determined by the quality of the nitre of which it is partly composed. This ingredient, as already observed, having a strong tendency to absorb moisture, requires that it should be kept in its purest state for the manufacture of powder. When mixed with salt its quality is greatly deteriorated; and, in all good powder, it is well known that its expansive force is in proportion to the velocity with which the communication flies through the whole mass. It is this principle which renders it so well adapted to sporting purposes. No bird or quadruped can fly or run with such rapidity as to get beyond the quickness of its action, provided either be within range. It is this quickness of ignition which gives, in the field, such an advantage to powder over every other substance.

The method of testing the quality of powder, instituted and pursued by the Board of Ordnance, is as follows:—The triers first take out of the several barrels of gunpowder a measure-full, of about the size of a thimble, which is spread upon a sheet of fine writing-paper, and then fired. If the inflammation be very rapid, the smoke rises perpendicularly; and if the paper be neither burned nor spotted, it is then judged to be good powder. Then two drachms of the same powder are exactly weighed and put into an *epreuvette*, which, if it raise a weight of twenty-four pounds to the height of three inches and a-half, is received into the government magazine as proved.

This powder-trier just mentioned, called an *epreuvette*, may be seen in many gunsmiths' shops. It does not, however, test the power of the explosive substance with very great nicety, but it is, nevertheless, a useful instrument; and it furnishes the sportsman with a general idea on the subject, which enables him, in many cases, to detect a bad and impure commodity.

Percussion gunpowders have effected great changes in sporting art, and the science of projectiles generally. Detonating substances are but of modern date.

The discovery of *fulminating mercury*, which forms the percussion powder now in use, is attributed to Mr. Howard; the full particulars

of which are detailed in the *Philosophical Transactions*. It is thus manufactured, as given by Dr. Ure:—A hundred grains of mercury are to be dissolved by heat in an ounce and a-half, by measure, of nitric acid. This solution being poured cold into two ounces, by measure, of alcohol in a glass vessel, heat is to be applied till effervescence is excited. A white vapour undulates on the surface, and a powder is gradually precipitated, which is to be immediately collected on a filter, well washed, and cautiously dried with a very moderate heat. The powder detonates loudly by gentle heat, or slight friction. The fulminating mercury should be moistened with about thirty per cent. of water, then triturated in a mortar, and afterwards mixed with the sixth part of its weight of gunpowder. Matches, caps, &c., made in this manner, resist damp, and do not corrode the instrument which contains the powder. It has been often ascertained, by experiment, that they have frequently ignited after having been immersed in water several hours. This is the method which is adopted in the manufacture of percussion-caps. The recipe for making them, in Paris, is thus given by the *Bulletin des Sciences Militaires*:—"Having triturated ten parts of fulminating mercury on a marble slab with water, by means of a wooden muller, add six parts of gunpowder, and grind the two together." Dr. Ure observes, that some of the best match-powders made in France do not, altogether, weigh more than two-thirds of a grain.

THE DIFFERENT KINDS AND SIZES OF SHOT.

In reference to this part of our subject, there is some degree of confusion, on account of the sizes and numbers not coinciding in all the manufactories where shot is made. This circumstance tends to mislead sportsmen, and very often to give rise to false theories upon the force and resistance of projectile instruments generally. An ounce of No. 7 shot taken from the manufactory of Messrs. Walker and Parker, contains 341 pellets; and the same weight from Mr. Beaumont's, 398. Add to this, that in some places the usual numbers are reversed. The following is a list of the shot in Messrs. Walker's firm, with letterings, number marks, and the number of pellets in an ounce:—

AA	40	4	177
A	50	5	218
BB	58	6	280
B	75	7	341
1	82	8	600
2	112	9	984
3	135	10	1,726

Mould, drop, or swan-shot, are of large size, and commonly used for wild-fowl shooting. They are lettered, and the pellets numbered as follows:—

	Number of Pellets to 1 oz.
LG	5½
MG	(hardly) 9
SG	11
SSG	15
SSSG	17

As to what is the best kind of shot to be used for sporting purposes there are different opinions. Colonel Hawker maintains that, for ordinary purposes of game shooting, No. 7 is the best kind that can be used. It lies closer and more compact to the barrel, he says with reason, than any other. Other sportsmen, again, think the Nos. 3 and 4 are to be preferred to any other sizes for common every-day work in the prime of the shooting season. Captain Williamson pleads for No. 9, and General Hanger for No. 2. Another great authority informs us, that in the first month of partridge shooting, shot No. 5 should be used, because, at this time, the birds spring at hand, and we seldom fire at more than the distance of forty yards. If a shooter takes a fair aim, he can scarcely fail to do some mischief by such a circle or disc of shots. Hares likewise, at this period, sit closer, and being but thinly covered with fur, may easily be killed with this size at thirty or thirty-five paces. In snipe and quail shooting this shot is most to be preferred. When October advances, the birds are stronger on the wing, and then No. 3 will be found more suitable. This shot, it is maintained, possesses a proper medium between that which is too large and that which is too small, and will kill a partridge at fifty yards with certainty. It is adapted for all kinds of game. It is contended that distant objects may be killed with large shot; but this consideration cannot bear upon the question

which involves the destruction of a number of birds within a comparatively short range, and where the shots are numerous. Having given these statements, we shall leave it to the reader's own experience to decide which is best. To go on alluding to the various and conflicting opinions on the subject, would only perplex instead of enlighten his judgment on the point of dispute.

Mixed Shot is used by some who have spoken highly of it. But here we have controversion again. Some sportsmen have even ridiculed the idea of such a thing in no measured language; but Mr. Daniel informs us that his uncle, "who was allowed to be one of the best marksmen of his time, after minute trials and mature experience, preferred it to every other kind." "Gamekeepers," he continues, "frequently use it; and many persons in this class are in the habit of trying and knowing what shot will do most execution; and are men who generally draw their reflections and remarks from actual and successful experiment. It is true they do not write a treatise upon the subject; yet, from killing game and animals at all times, are, at least, as likely to form a just decision as gentlemen who, for the most part, only use their guns three months at the commencement of the season. The numbers of shot proper to mix together, for general use, are 4, 5, 6, and 7." There is also a difference of opinion regarding the *patent shot cartridges of Ely;* and as it is impossible to reconcile opinions so at variance with each other, we will let the subject rest.

CAPS AND CAP-CHARGERS.

Copper Caps and Cap-Chargers are now almost in universal use. In the purchase of copper caps it is prudent to make a trial of one or two taken promiscuously from the mass, to prevent disappointment. All foreign caps should be purchased with care; some are excellent; others wretchedly bad, and even dangerous. All should be cupped to the exact gauge of the diameter of the nipple. If they are too small they will not explode; and, if too large, the cap of the second nipple will be apt to fly off when the other is fired.

Mr. Greener treats of *iron percussion-caps*, in the *New Sporting Magazine* (No. 65). He recommends them on the ground of the tendency of the copper to become injured, when exposed to damp, to such a degree as to be converted into a paste incapable of ignition. He maintains that when powder is flashed, or exploded around the nipple of a gun, the residue left, attracts moisture instantaneously. To remedy this, the use of iron caps is enforced. "They are much easier to explode; they detach no broken particles to wound the shooter, nor even expand so much as to stick in the head of the striker. They do not stain the hands, and they might be made cheaper."

Cap-chargers are of French invention. There are several varieties of them; some long, and some round; but, we believe, the latter stand highest in public estimation.

WADDING.

Gun-waddings have a considerable influence on the sports of the shooter. However good a gun may be, and however excellent all its principal appendages—powder, shot, &c.—still they may all be rendered nugatory if the proper wadding be not used. But we find in all questions relative to shooting, that in proportion to their real intrinsic importance, so likewise is there doubt and uncertainty in settling them. Some recommend card wadding, some hat wadding, and some pasteboard. But, whatever material is chosen for this purpose, it should be strictly regulated according to the bore of the barrel. Wadding punches are often made for distinct barrels, when more guns than one are used. The range and delivery of the shot are greatly influenced by the wadding. The common opinions on the matter are, that all waddings should be quite close to the barrel, but not rammed too hard. The material should be rather soft than otherwise, and yielding to a certain extent, but still of sufficient consistency to carry the shot in a body to a certain distance from the muzzle of the piece. For if the wadding is rammed too close, or is of a hard and rigid nature, such as stiff brown paper, the piece will recoil, and the shot will spread; if, on the contrary, the wadding is not sufficiently close, and is composed of a slight and too pliant material, such as wool or cotton, it will not have enough of consistency to carry shot, and the discharge will lose its proper force. Besides,

a certain portion of the shot, which is more immediately in contact with the wadding, will be melted by the explosion of the powder. Mr. Greener says, "that a substantial wadding, between the powder and the shot, is equal to a considerable artificial friction in improving the strength with which the powder expels the shot. It answers the purpose of completely preventing the explosive matter becoming mixed with the shot; and the powder is confined the same as it would be were there a ball in the barrel that fitted tight. Thus the whole force is properly exerted."

Walker's metallic gun-waddings have a considerable reputation, partly from the fact of their metallic edges preventing the surface of the barrel from becoming leaded. Other waddings are likewise recommended, as Joyce's, Wilkinson's, and Beckwith's. The principal object is to keep the whole charge in the gun as compact as possible, that it may act least offensively on the gun, and most effectively on the object aimed at.

THE RIFLE.

Up to this point we have said nothing about the *Rifle-gun*, which is used in deer-stalking, and rook-shooting. The barrels in all rifles are much stronger and heavier than those of the ordinary fowling-pieces. The bore has long been manufactured with indentations within, which form spiral grooves throughout the entire extent. The principle on which all rifles are made, and the object they aim at accomplishing, is to impart to the ball a rotary or spinning motion round its axis, as it passes out through the barrel. The old mode of manufacturing pieces of this kind failed to accomplish this purpose to any great extent; but modern art has effected a considerable change for the better. The barrel of a rifle is now cut with only two opposite grooves; and the ball being framed with a projected belt or zone round its equator, of the same form as the grooves, it enters so readily into these hollows, that little or no force is required to press it down upon the powder. The general result has been, that guns of this character carry either ball or large shot much further, and with a vastly increased impetus, than can be done by the common flint or percussion fowling-projectiles. The locks for rifles have, likewise, undergone a great change, and many important alterations and improvements have been effected in their structure and mechanism. By reversing the position of the main-spring, the general compactness and strength of the works have been increased, and rendered more powerful, durable, and easy of repair. The ignition of the powder is so certain, that a misfire is rare in good rifles. They are getting daily into more general use in sporting circles, not only in this country, but on the continent, and in the United States of America.

In bringing our observations and descriptions of the gun to a close, we may observe, that every reader of sporting works on this instrument, must have remarked the very conflicting opinions respecting its uses, and the nature and character of its prominent attributes. These opinions are so contradictory, and are frequently set forth with so much confidence and dogmatism, that the impression is forced upon us, that the true theory of projectiles is not yet perfectly understood. Much, however, is now being done to master the subject; and we have no doubt, that opinions more generally correct, and easier to be reconciled with each other, will, at no distant day, pervade the minds of all intelligent sportsmen throughout the country.

We find in almost all the more elaborate treatises on the gun, a loose and inconsequential mode of reasoning adopted. Facts are mingled with theories, and theories with facts; and there is no regularly concatenated chain of reasoning on the subject. The systematic writers on the fowling-piece seem, in many cases, to have set out in their inquiries with some preconceived theory, to support which they either mould facts already ascertained, or mould the theory to the party, and thus endeavour to establish much that is not tenable, or worthy to be established. The mere mercantile enterprises connected with sporting, have tended, in many cases, to prevent the free current of inquiry into the offices of the gun. A gun-maker invents something which he conceives of importance, and takes out a patent at a considerable expense. He is naturally desirous of having his invention made known, and he accordingly does all he can to have it puffed, or recommended throughout the country.

Sportsmen are generally greedy listeners to all novelties. The invention is found, when tested by a pretty general use, not to realise all the advantages anticipated from it. It is then taken out to nurse, and to be bolstered up with a mass of theoretical speculation, which appears on the surface very profound, but which is, in fact, nothing but a series of ill-digested notions, and gratuitous assumptions. Readers are bandied about from one theory to another, till they are lost in obscurity and chaos.

As every gun is an instrument *per se*, and has a character of its own, the person that may be accustomed to it feels quite strange when a new piece is placed in his hands. We have read somewhere of a sportsman being often amused with the conversation of gamekeepers, and others, about their respective fowling-pieces. They talk of them as if they had life and volition. They say, "I know that gun well; she'll do very well in one way, but she's obstinate in another. She's a curious-tempered piece. I have known her on a particular day take the sulks, and no good could be done with her; at other times she killed all before her." The fact is, that the gun is an embodiment of very important and hidden principles of mechanics and chemistry. We see the effect of it; but the *causes* are often, and, indeed, in nine cases out of ten, wrapped in impenetrable mystery. Daily experience is the only means of obtaining a perfect knowledge of the capabilities of this instrument, because its powers are so easily modified by causes which escape ordinary observation. This is the reason why practical men gain such a stock of useful information on the use of fowling-pieces, though they are seldom able to impart that knowledge to others.

CHAPTER II.

MOORS AND OTHER SHOOTINGS; NECESSARY COURTESIES; SELF-HUNTING DOGS; A SUMMARY; ENGLISH MANORS; HINTS TO YOUNG SPORTSMEN.

As many desire information on the subject of hiring moors and other shootings, and, at the same time, seek for a knowledge of the best method of getting up a head of game, and of preserving and protecting the same, this seems to be the most suitable place to supply these, from such sources as we have been able to bring within our reach. We believe it is admitted, by all practical sportsmen, that the months of March and April are the best for the purpose of ascertaining the stock of game on all grounds, and especially on the moors; and offering, at the same time, the most favourable opportunity for trapping and destroying vermin of all sorts, and of extending other necessary protection to game, without which the best prospects of sport may be neutralised. In the first place, we will confine our remarks to the Scottish moors, reserving the subject of manors, and the preservation of game in England, for after consideration.

Why, it may be asked, are the months just alluded to the most favourable for securing shootings in Scotland? The question is readily answered. It is because an accurate estimate may be obtained of the stock of grouse equally on the Highland and on the Lowland moors—the packs (or, more correctly speaking, the surviving portions of them) which had migrated during the severe weather of winter, from the high ground to the distant lowland moors, having returned to their native hills to breed; and the low grounds retaining only those birds which actually belong to them, and which alone can be relied on to remain and breed on such ground. This must always be borne in mind relatively to lowland moors; for, if an estimate were sometimes formed of them from the amount of grouse

found in the months of November, December, and January, great disappointment would be the result in the month of August. We are aware that there are lowland moors which are almost without grouse in the months of August and September, but are abundantly supplied from distant high ground as soon as the severe weather sets in in November, and sometimes as early as the end of October; but, should the winter be mild and free from storms, the migration is very limited. We mention this fact by way of caution to those who, in any subsequent years, may be about to rent a lowland moor, not to go over the same till the severe and winterly weather be passed, as grouse which have migrated from the high ground rarely return till the end of February. In some excepted seasons, when the severity of winter is protracted, they have been known to remain till March, simultaneously moving off on the first change of weather.

In March or April, no grouse will be found on either high or low ground, but such as belong to each respectively, and these may be relied on as the stock of the ground; and, as they will be in pairs, an additional reason for delay, till this season, is suggested in the facility which is afforded by this circumstance, of arriving at a tolerably fair estimate of the amount of birds on the ground, and of the prospects of sport for the ensuing season, through the medium of an intelligent keeper and a good brace of dogs.

The best moors are unquestionably those of Perthshire, Aberdeenshire, and Inverness-shire; and if the sportsman will take a lease of five or seven years, which he will find most conducive to his interests, he will adopt the surest means of having six years of first-rate sport; even admitting, for argument's sake, that the stock of grouse has been so reduced by previous hard shooting or other adverse circumstances, as to make the entire or partial sacrifice of the first year expedient as a foundation for future sport. This necessity may sometimes arise, and should not be disregarded, as a neglect of it might be attended with subsequent disappointment. The sportsman will, therefore, do well, if he will permit us to offer a suggestion, to be influenced by the report of a competent keeper as to the state of the ground, and be guided by his advice thereon.

In the counties just named, the moors are so good and so favourable to grouse, that one year's forbearance, with judicious management, admitting the stock to have been reduced by too hard shooting or disease, suffices to restore them to first-rate condition; for, in addition to the increase of the stock on the ground, many packs driven from adjoining moors, finding that they are not molested, will remain, and reinforce the native stock: in fact, the effect of one year's jubilee on a really good moor, surrounded by equally good ground, is wonderful; the effect, to be believed, must be witnessed. But these favourable results depend upon one important condition; which is, that the head-keeper is a first-rate man in his particular department, and is allowed a competent staff of subordinates, and all other requisite accessories. If there are a number of old cock grouse, these should be killed off, as they do infinite mischief in the breeding season; but an experienced keeper will be alive to this necessity, and will act accordingly.

As a proof of the excellency of some of the moors in the shires alluded to, we may instance the sport obtained by three gentlemen in one season, on the Carr-bridge shootings, which comprise thirty thousand acres. They are in Inverness-shire, and were visited a few years ago by Sir H. Wilmott, Mr. Bass, and Mr. S. W. Hurtell. They killed, during the season, 6,700 grouse, 211 black game, 400 hares, 136 partridges, 5 roe, 52 snipe, 26 teal, 12 woodcocks, and 12 plover: total, 7,554 head.

On another estate, in the valley of Findhorn, in the same shire, two *guns*, with a brace of dogs each, killed, from the 13th of August to the 10th of September, shooting on alternate days, or sixteen days in all, 1,035 grouse, 144 hares, 2 black game, 10 partridges, 1 wild duck, 1 woodcock, and 1 rabbit; total, 1,194. This estate comprises only 4,000 acres.

There may be moors as good in other counties as those which are found in Perthshire, Aberdeenshire, and Inverness-shire; but, as a rule, the sportsman will not incur any liability of disappointment if he hires a moor in any one of the three named counties, provided he

has a good lease; and this cannot be said of every other county in Scotland, as the complaints of sportsmen but too frequently testify.

NECESSARY COURTESIES.

Presuming that most sportsmen *will* make a partial sacrifice of their first year's sport, should the necessity arise, the next consideration will be—what is the best policy to be pursued in commencing and carrying on the management of the moor? Are there any parties whose good offices will be of service, and whom it will be advisable to conciliate? Unquestionably. The tenants and shepherds, as they can be either the best of friends, or the worst of enemies (game generally being more or less in the power of the former, and all nests at the mercy of the latter), must be conciliated and made friends of; and a head-keeper, who understands his business, will immediately endeavour to cultivate an amicable alliance with both parties, but especially with the latter; and this he will easily accomplish with a little tact, and through the persuasive medium of a little tea and tobacco, judiciously moistened, at opportune intervals, with some whisky—tea for the wives, and tobacco for the husbands. The head-keeper, being generally a diplomatist in *his* way, will, of course, commence with the wives; tea, in this instance, being wonderfully effective. Its operation is similar to that of a well-set bracelet in the higher departments of life, opportunely introduced and judiciously applied, extending its influence, through the same medium, to the person whose services are required. A few pounds placed at the disposal of the keeper, will enable him to carry this policy completely into effect, and are well applied; and when the shooting party are on the ground, no favourable opportunity should be lost of cultivating the friendship of the shepherds and tenants by a kind word, *en passant*, accompanied by a glass of whisky. Those who neglect little opportunities of cultivating the goodwill of farmers and tenants, neglect their own interest as sportsmen, and are but poor diplomatists in dealing with northern Highlanders, who are extremely sensible of any little act of kindness, and are not unmindful of what they consider as a slight, or discourtesy, and are true to their motto. Let those who visit the Highlands remember *this*. We would not, however, prescribe the use of whisky to the sportsmen themselves. They carry a dangerous weapon, and have to use it with steadiness and effect. We recommend it, however, as a powerful instrument for securing the good offices of others, as every man who calls on you, whether he be farmer, shepherd, or herdsman, expects a "glass;" and if he does not get his "glass," he is disappointed, and he mentions the circumstance. In fact, the payment of this little tribute is universally expected—it is the custom of the country. No marked event, or ceremony, ever takes place without the introduction of whisky; whether it be either a marriage, birth, a christening, or a funeral, it is the Alpha and the Omega, the beginning and the end. It is administered before and after a funeral; and so general is its use, that we have never seen any Scotchman refuse it, whatever his position in life may be. All Highlanders contend that it is wholesome and necessary, although some few exclaim against the abuse of it; but as it is the only stimulant, with the exception of tobacco, which is in use, it is not surprising that recourse should be had to it in a land of such frequent mist and rain.

SELF-HUNTING DOGS.

Moors, which have been somewhat neglected, are sometimes overrun with self-hunting dogs. These marauders, coming from a distance, equally in search of game and dead sheep, should be unceremoniously dispatched by trapping and with the gun, as they do infinite damage in the breeding season; but this business a Scotch head-keeper thoroughly understands. Farms and cottages are sometimes overstocked with dogs given to self-hunting. These should also be disposed of; but this requires tact, and must be done quietly and judiciously. The shepherds' dogs must never be molested; moreover, there will rarely be any necessity to interfere with them when the shepherds are the allies of the keepers, as, in that case, they will always be kept in at heel, except when they are performing their necessary duties in keeping the sheep within particular limits, or driving them to fresh ground.

Painted by A. Cooper R.A.

Engraved by R. C. [illegible]

If shepherds are negatively of importance in abstaining from either poaching or destroying game, they can also be actively serviceable in giving information as to the incursion of any enemy, either in the shape of vermin or poacher. From being constantly on the ground, no moving objects can long escape their observation.

A SUMMARY.

A summary of the preceding suggestions, as to hiring and protecting moors, addressed to the sportsman, may be the means of fixing them more firmly in the minds of our readers:—

1. If you are desirous of having grouse shooting in perfection, take your moor in Perthshire, Inverness-shire, Aberdeenshire, or Caithness.

2. Should your object be mixed sport, combining with variety of game, winter shooting and fishing, the parts of these counties which adjoin the sea-coast will answer your purpose best, as these districts, besides grouse, black game, and partridge, frequently afford good wild-fowl and cock shooting, together with trout and salmon fishing, and, very frequently, first-rate sea-loch fishing.

3. Although Perthshire, Aberdeenshire, and Inverness-shire, throughout the greater part of their extent, furnish as much variety of first-rate sport, of every kind, as any counties in Scotland, in addition to the very best grouse shooting; still there are some few of the very best inland moors on which there is no winter shooting—in fact, little game beyond grouse, there being no covers; and, on some few moors, little or no fishing. This fact is mentioned for the guidance of the sportsman who may require additional sport to grouse shooting.

4. Secure your shootings by a lease for five or seven years.

5. Before signing your lease, if you do not know the moor, and are not satisfied as to its immediate condition, send a competent person over it with a brace of good dogs; you will then ascertain what stock of grouse is on the ground, and make your terms accordingly *relative* to the *first* year; as, in the event of total forbearance being necessary, or the number to be killed being limited, in consequence of the reduced stock on the ground, some allowance must be made in consideration of that circumstance.

6. Immediately on obtaining possession of your moor, locate a first-rate head-keeper thereon, with authority to provide himself with a competent staff, the strength of which will depend upon the extent of the ground.

7. Engage your moor, if possible, early in March, and not later than about the middle of April; because the trapping of vermin ought to be commenced, at latest, in March (as it cannot be delayed without damage to the stock of game on the ground); and, grouse being in pairs, a tolerably accurate estimate may be formed of the quantity likely to breed on the ground, and of your prospects of sport for the ensuing season.

8. If the moor you have in view be a Low-land one, do not examine or engage it before March, because a quantity of grouse might be found thereon prior to that period, not belonging to the ground, only waiting for a change of weather to return to the high ground from which they had migrated in the early part of the winter, and thus deceive your calculations, and disappoint your expectations of sport for August, should they be based on the number of grouse found in January or February.

9. The head-keeper should be a Scotchman, an Englishman being comparatively useless, Gallic being the language generally spoken in the Highlands; and, moreover, an English keeper has little influence with tenants, shepherds, and under-keepers. The head-keeper should thoroughly understand his business in all its branches; and, with intelligence, activity, and zeal, should combine honesty, sobriety, and courage. All these qualities are required for a thorough discharge of the duties incident to his position.

10. His duty, in the first instance, will be to go over every part of his ground, and make himself thoroughly acquainted with the marches—*i.e.*, boundaries; and, if possible, obtain information respecting the adjoining moors and the tenants thereon, in order to regulate the beating of the ground when the season commences; as, of course, every precaution would be taken not to drive the birds off your own ground on to a moor where "hard shooting"

has been constantly pursued; being less particular as to a deer forest.

11. His next duty will be to ascertain, to the best of his ability, the number of grouse on his ground, the probable prospects of sport, and the number of brace which ought to be killed.

12. To cultivate a friendly alliance with the tenants and shepherds, and obtain from them all useful and local information.

13. To commence trapping and destroying all ground and flying vermin.

14. To counteract and prevent poaching.

15. To give thorough and complete instructions to the under-keepers, assigning to each of them his particular beat and separate duties, which he will personally ascertain that they attend to, by being up and on his ground frequently before daylight, so as to anticipate and watch their movements. If a head-keeper has not zeal and activity, as well as considerable intelligence, he is altogether unfit to take the charge of a large moor; but Scotch head-keepers are generally superior men, and thoroughly competent, in every respect, to fulfil the numerous duties which devolve upon them.

16. In the month of March, previous to the burning of the heather, the head-keeper will go over the ground with the different shepherds, and arrange with them as to the portions of heather which ought to be burned. If the shepherds are friendly, they will not exceed the limits agreed on; but, as it frequently happens, on a large moor there are small tenant-farmers, who look after their sheep and cattle themselves. These individuals must be attended to, as they are rather difficult to control, and will always burn to excess if not prevented. The keeper and his staff, on these particular occasions, must exert more than usual vigilance. No heather can be legally burned after the 10th of April, the penalty for each offence being £5.

THE MANORS.

Quitting Scotland, we now come to England, where it is much more expensive, and more difficult to preserve game. This arises from there being a far greater number of poachers; and from pheasants being generally the principal feature in a large preserve, in which feeding and watching are requisite at almost all seasons of the year. Hares and rabbits, also, occasion an expense, inasmuch as they do considerable damage; consequently compensation is frequently required by the farmer; and they also require protection from the poacher. We are not aware that partridges do any damage. The advantages of grouse are, that they require no food beyond that which the mountain produces; and, moreover, three or four men will, in Scotland, take care of thirty thousand acres of land; whereas in England some half-dozen keepers will not, at all times, suffice to protect five thousand acres of land.

Partridges, pheasants, and hares, being the principal object of a sportsman's solicitude on a manor in England, let us inquire what means can be most effectually adopted for their protection. Partridges are easily protected, it being only necessary, immediately after the harvest, to have all the fields, in which they are likely to jug, staked with strong blackthorn, driven well and firmly into the ground, sufficiently close to prevent the use of a net; as it is by dragging a net over the surface of the land that whole coveys of partridges are taken when they are jugging; so that a country is soon cleared if this wholesale description of poaching is not counteracted.

In Suffolk and Norfolk, some manors of four or five thousand acres will permit of two thousand brace of partridges being killed in a season; in fact, on some of the most favourite soils for them, the only difficulty is to shoot them sufficiently close to ensure a favourable breeding season, so numerous are they, and so difficult to be reduced by fair shooting. As a rule, where abundance of grain is grown there will be plenty of partridges. There are, however, exceptions; as there are large districts in which the finest crops of wheat are produced, where partridges are not numerous. The reason is obvious; the soil which produces wheat only not being so favourable to partridges as that which produces rye and barley. In fact, such a soil as that which pervades the greater parts of Suffolk, Norfolk, Cambridgeshire, and Huntingdonshire, is best for partridges; and, we believe, there are more of these birds, as well as of other game, in these

favourite districts than in any counties of England. On these soils the water never lodges; and in dry, hot weather, there are never any cracks or openings, which are frequently seen in stiff soils in hot weather, into which both young partridges and pheasants fall, without being able to extricate themselves, and are, consequently, victimised; and wet weather is equally prejudicial to young birds on the stiff clay soils. On a really good and favourable soil, any amount of partridges may be got up, which the land will bear, in one or two seasons, by a little forbearance, if the stock be reduced; but any deficiency is rarely the case in either Suffolk or Norfolk, if the land is fully cultivated. In the case of partial neglect in this respect, or in the event of a farm being accidentally left fallow one season, the same amount of birds cannot be expected, as partridges will always go where they can find most food; and, although they can live on grass, they will always leave pasture lands if arable land be contiguous.

It is conjectured by some, that partridges which are found in grouse districts eat heather. This, on the other hand, is supposed to be a mistake, as birds have frequently been killed, during the winter months, on the mountain-tops, and, on opening their crops, nothing found in them but grass, and that, on several occasions, of a very coarse description, having the appearance of water-grass. These birds, however, are of very fine flavour.

It is a good plan, and one which is frequently adopted in Suffolk and Norfolk with success, to introduce drills of buck-wheat here and there between the turnips, where the fields of these are large. This is advantageous to both partridges and pheasants, as these birds are particularly fond of this grain—it attracts and keeps them together.

In very open countries, where there are neither covers nor plantations, small patches of furze and broom should be sown, here and there, on all odd corners of land. These will be found wonderfully protective of partridges in the cold stormy weather of winter, and, moreover, will be secure breeding-places. Partridges generally breed by the hedge-side, or on grassy banks, and not unfrequently by the road-side. Where there are walls, if there is a little rough grass and brambles at the bottom of them, these are also very favourite spots, although close by a footpath. Where the country is very open, and there is a scarcity of shelter, they make their nests in grass and clover; and here they are in great danger, as both grasses and clover are generally cut before the hatching is over. Consequently many nests are destroyed, notwithstanding the utmost carefulness of the mowers, as partridges sit so closely immediately before hatching, that there have been instances of their heads having been cut off by the scythe. When the nest is discovered in time, a small quantity of clover left round it will suffice to prevent its desertion. These birds sit twenty-one or twenty-two days.

In the spring of the year, when partridges first begin to lay their eggs, the utmost vigilance is demanded on the part of the keepers, owing to the practice of stealing eggs, encouraged by poulterers, who carry on a large trade by the sale of them, partridges' and pheasants' eggs always being obtainable at the London markets, and from most London poulterers; and as long as gentlemen will continue to countenance this traffic, by buying eggs for the purpose of stocking their grounds, they must expect to be mutually pillaged. We could here introduce many letters upon this subject, but it would be unnecessarily filling our pages. Partridges will always make a second nest when the first is destroyed; but the number of eggs will be considerably reduced, and the coveys so late, that the young birds will not be ready for the sportsman by the 1st of September. Whenever a small covey of backward birds is found, it may be inferred, to a certainty, that the first nest was either robbed or destroyed; six or eight birds is generally the amount of a second covey. In an early covey, as many as twenty young birds have been found; but this is unusual; and, although as many as sixteen and eighteen eggs in the nest is a common circumstance, still fourteen young birds, on the 1st of September, may reasonably be considered a good covey. We cannot advise any sportsman to buy partridge-eggs for the purpose of stocking his ground, because we consider the practice wrong in principle, and one which is sure to meet with retributive punishment; and, moreover, on good soils, where partridges can be

got up, the object is easily accomplished by a little forbearance combined with protection, without this extraneous aid. In the case of nests being found in dangerous positions, it is a very good plan to take the eggs and place them under a hen; and it might, perhaps, answer to take the eggs from some of the nests on the distant part of the ground, provided this be done at the early part of the season, as, in this case, there would be a second nest. It must be recollected, however, that these home-bred birds, even if success attended their rearing, are indifferent breeders for the rfist year. The experiment has been tried, and many of their nests found, but they seldom, if ever, contain more than fourteen eggs, twelve being the average. There is, however, one great advantage, that they will all breed near home; and, after the first season, the young birds will, in all probability, stock the more distant ground. When partridges are plentiful, it will always be advisable, at the end of the season, to have the extra old cock birds killed off, as there are always many more cocks than hens; and if the former supernumeraries be left, they will do infinite damage, by destroying many nests, and disturbing the hen birds whilst they are sitting. A good shot will easily pick the cock birds out on the rising of a covey, as the horse-shoe mark on the breast is very visible. This should be done in February and March.

In reference to the subject of stocking manors, some recommend the turning out of red-legged partridges, whilst others recommend their destruction; and, considering the many disadvantages attending the presence of these birds, it is a matter of surprise that they should have met with any encouragement from practical sportsmen, as we are not aware that they possess any one single redeeming feature to counterbalance their numerous bad qualities, with the exception of their appearance, which is decidedly in their favour, as they are, unquestionably, a handsome bird. They are constantly to be met with in both Suffolk and Norfolk, where, by many, they are considered as a great nuisance. But it may be as well to enumerate the objections which are made to them.

In the first place they are very pugnacious, and, from being a larger and more powerful bird than the grey partridge, they easily drive these off their beat; consequently, if they were encouraged to any extent, a considerable diminution in the stock of the ordinary partridge would be the result. In the next place, they invariably spoil sport, as they are ever on the move, either flying or running, consequently disturbing the other birds when disposed to lie and give sport; and, moreover, do not compensate by giving you a shot at themselves, as it is very rare that you can get a chance at them, except in the case of a surprise in the corner of a plantation, or cover, or thick piece of turnips, at the end of which a strong fence may prevent them from running further, as they never cease running when once in motion, except their course is obstructed by some impassable obstacle. We have frequently marked them down in turnips and furze, and been disappointed in getting a shot, finding, by the time we had reached the spot where we had seen them drop, they had already emerged, and were running as fast as their legs could carry them, at the distance of some hundred yards or more. In fact, it is an endless and hopeless affair to follow red-legged partridges in an open country, however well it may be supplied with turnips. We have frequently made the experiment, and can, therefore, speak with some degree of certainty on this point; and, moreover, in the pursuit of these birds, you not only fruitlessly exhaust your patience, but spoil your dogs, as they will sometimes run a mile before them, at least, if the dog's patience will last so long; but it sometimes ends in his having a run too. In fact, these birds will ruin the best dogs, and are only fit to be hunted by spaniels. The bird is certainly a fine bird on the wing, and affords a good shot when you can get it; but the last, and by no means the least, consideration is, that when you have shot him he is not worth eating—at least we think so; but far be it from us to dictate, or prescribe, in matters of taste. However, we have never met with any Englishman who differed with us on this point. Their flavour is flat and insipid—in fact, disagreeable. We are aware that this bird is highly esteemed in France; but as he is rarely eaten *au naturel*, but generally accommodated with a copious supply of truffles,

enhanced by some *sauce piquante*, his natural insipidity is disguised; and *then*, as Monsieur Chevet observes, of some of his favourite comestibles, *il se laisse manger*. We have seen him brought to table on many occasions dressed *au naturel*, and withdrawn without discussion. He may, perhaps, have been tasted, but no further honour was paid him.

Regarding the pheasant, we must remark that he is well worthy of all the care and protection which can possibly be extended to him. He is unlike the partridge in one respect, not being attached to any particular spot of ground, although he will remain in any suitable cover when he can find sufficient food, and is free from molestation; but if he cannot find food, and the soil does not produce it, and it is not supplied to him, he will take to his legs, and search for it for miles till he finds it, and remain in his new quarters so long as he is undisturbed. Where partridges have once bred they will breed for years, and very near the same spot; hence the policy of never killing any covey entirely down. This is not the case with pheasants, as the hens will remain to breed in any cover to which they may have been driven at the end of the season, provided it be a suitable one, and there be food; hence the necessity of always providing sufficient food as an inducement to them to remain. But even this will be ineffectual unless the covers be kept perfectly quiet, as pheasants will not remain where they are constantly disturbed. The slightest movement in a cover sets them in motion, running at their best pace, and not stopping until they reach some thick place, where they can conceal themselves. If the cover is large, it may be occasionally disturbed without much risk; but if it is small, and thin at bottom, they will run clean through it, and, perhaps, continue their course for miles. The best cover to keep pheasants in, is one of furze and broom, as they can conceal themselves in it; and, if it be spacious, even a dog has some difficulty in dislodging them. In an open country where there are no natural covers, this artificial cover of furze and broom will be found to be of the greatest advantage. It can easily be got up in a few years; and a few rabbits turned into it, will be useful in making runs through all the thick parts of it. It is also undeniable for hares; and, moreover, game of all sorts is easily protected in it, as a poacher can only operate in and about such a cover by daylight; and therefore must be seen approaching, if a good look-out be kept. A small cover of this description, of about six acres, adjoining a keeper's cottage, has been known to hold several hundred pheasants. It was surrounded by corn and turnip fields, and some few plantations running up to it, into which the pheasants strayed by day, returning always at feeding-time, or in the event of their being disturbed.

If there be water handy, it will be a great advantage, as pheasants cannot do well without it. It must, therefore, in the event of there being neither spring nor pond near, be supplied by artificial means—tanks, sunk in different places, which the keeper will take care to fill regularly, will answer the purpose. Pheasants require, more or less, feeding nearly all the year round; less in summer than in winter, and but very slightly after the harvest. A little food, however, occasionally at all seasons, keeps them together, and prevents them from prowling. Barley, oats, white peas, buckwheat, and boiled potatoes, comprise what they are most partial to. Of buckwheat they are especially fond, a few acres of which will attract them, and partridges also, from very long distances; consequently, this being known, its use in both Suffolk and Norfolk is almost universal, not only on the general principle of preserving, but on that also of self-defence.

The advantages of the furze and broom covers, consists in their affording protection to the pheasant by night as well as by day, as pheasants frequently jug in them, so that they are out of the poacher's reach. But as, in this case, they will be accessible to ground vermin, the keeper must be very particular and vigilant in this department of his business: the weasel, stoat, polecat, and common cat, would do infinite mischief in a preserve of this description. As the presence of these depredators, however, is easily ascertained, and as they are trapped without difficulty, the keeper must have neglected his duty if more than an occasional visitor is ever seen; but he must always be expected, as vermin are sure to be plentiful where game abounds. In all preserves it is a good plan to have a few rabbits, as they frequently save the lives of pheasants when any

hingling is attempted, by either being caught instead of the pheasants, or by knocking the wires, or springes down, as both are used. When pheasants are merely wanted for the market, in the game season, wires are used, as they are more easily set, and more efficient than springes; but in the spring of the year, when it is wished to take pheasants alive, to be sold to those sportsmen who wish to stock their preserves, springes are used with a knot in them, so that the noose cannot be drawn tightly when the pheasant runs his head and neck into them, by which means they are caught alive. This species of poaching, like the egg-stealing, would, in all probability, cease to exist, if sportsmen would refrain from purchasing live pheasants. Advertisers of live pheasants for sale, sometimes put forth, in their advertisements, that the pheasants which they offer have been reared by themselves, from eggs laid by birds in their own possession; but if there be one instance of this sort, it is an exception, even if the birds which laid the eggs were not originally poached; and, moreover, this may only be a blind to more extensive transactions of an illegitimate character; but, as we have before intimated, its discontinuance rests with the sportsman. A combined resolution amongst sportsmen, not only to discourage the traffic in pheasants' and partridges' eggs, and in live pheasants, but also a determination to prosecute all offenders in this respect, would be productive of immense advantage, not only to sportsmen but to the community at large, as the stock of game is seriously injured by this yearly illegitimate practice. That the trade to which we allude is carried on, and pretty extensively, may be ascertained by any one who will give himself the trouble to make inquiry. The vendors are, of course, aware of their liability, and may not, perhaps, give information to every one requiring it, as we believe some caution is exercised in these transactions.

Having thus discussed the manner of proceeding in reference to the Moors and the Manors, we will now give a few

HINTS TO YOUNG SPORTSMEN.

There are numbers of shooting sportsmen who, from want of observation, or a "Mentor," to guide or direct them, plod on in their own invariable way, and suffer no end of inconveniences, when a few hints would entirely change the nature of things to their advantage. To such, and especially to the younger and less experienced, we crave permission to address ourselves. Our hints will be only to "little things;" but in little things lies the secret of enjoying greater. First, as to dress.

THE CAP.—We will begin with the head, and end with the feet. The cap ought to be as small as possible, for reasons we shall shortly explain. The kind, of all others, to be preferred, is exactly the size and make of a heavy dragoon officer's forage cap, but with the peak a trifle longer, and not lying quite so flat on the forehead. Wide-awakes are all very well, but you must, in the least wind, be always either snatching at them with your hand, or be keeping your head bent down on your chest, with the muscles of the forehead so contracted as to induce headache with many people. The cap should be small for another reason, and that is the liberty, especially in a wild country, of having to exert your energies in creeping after wild birds, such as carrion crows, hawks, &c., which may be detected in situations where they may be got at, and when a small cap may be carried in one of the pockets.

THE COAT AND TROUSERS.—Grouse-shooting is the only game-shooting in the three kingdoms that really requires attention to the colour of your dress. We should recommend, therefore, a good "heath mixture" coat and waistcoat, and the cap of the same colour. The trousers should be of stout material, of much the same colour as the other parts of the dress, and, for real service and comfort, be made as follows:—Procure, at a respectable currier's, two seal skins, and have the trouser legs covered with them in the form of a Napoleon boot—viz., coming well up in front of the thigh, and being hollowed out down the thigh behind, till you get two inches above the calf of the leg. With these trousers you can go through any cover, such as gorse, &c., with impunity; and, in case of having to drop on a knee in damp ground, no water will penetrate. An old pair of trousers will do to be covered with the skins, so that they are stout and not decayed; and, when worn out, the skins (which will last six or seven years) can be sewn on to another old pair. The seal skins cost about

6s. 6d. a-piece, and the softest and thinnest should be chosen. The trousers must be cut off about three inches below the knee before the skins are sewn on. After coming in from a day's shooting, in wet turnips or heavy ground, a few scrubs with a stable besom and water, just as you stand, sets them all right again, without the trouble of drying and brushing that shooting trousers usually require. The comparative invisibility of the shooting-dress named above has been proved, from having grouse come flying right on to the sportsmen, when sitting at lunch in the heath, and more especially on hilly moors.

Boots and Stockings.—The only sort of boots worth having are good strong country-made lace-up ones, with six holes laced, then six hooks, and after that two more holes. Have good nails in them, and let the toes be tipped with steel plates on the sole, and project at least three-quarters of an inch in a slanting direction downwards. This will defend the upper leathers at the toe from being cut by the strong shanks of the heath. In regard to snipe boots, the following plan has been found by far the best to be pursued:—Have the lace boots made sufficiently large to wear with a pair of Macintosh's waterproof fishing stockings, over common woollen socks. Walk to the snipe ground, carrying the waterproof stockings (which fold up into about the size of your hand) in your pocket. Then take off the lace boots, and put the waterproofs on, and the boots over them. The stockings reach right up the leg. When tired of shooting, rinse both boots and stockings in the nearest water-hole, and dry out the boots with a handkerchief, which is done in a minute; and then turn the stockings inside out, and carry them home in your pocket, and thus save the trouble of wearing them. You will not perceive the damp of your boots through your woollen socks. You will find the inside of the fishing stockings get quite cold and damp after they have been off some time; but that is not a sign that they let water in, but merely that the perspiration generated by walking has condensed. Let the stockings be well dried a good way off the fire, and they will last a long while—about six years. The original price of them is 16s., and the cost of new footing, 8s.

The Cloak.—The next thing to recommend is a small waterproof cloak, and the solid comfort of this must be felt to be appreciated. Although naming a cloak, there is no need for considering us as composed of either sugar or salt. In every situation of life comfort is everything. We therefore recommend a cloak, one of the beautiful light ones, made of black waterproof, that you can buy for about twenty shillings, and which will go into a small case. This case, if made with a couple of buckles, is fastened into the gun-sling, and is quite out of the way. The gun-sling we mean is the sort previously sold by Dean and Adams, and may be truly called a real blessing to sportsmen. It is no cockney or foreign apparatus, but a first-rate invention; and, for riding or walking home a long way, is invaluable. The gun sticks close to you, and you hardly know you carry one, and it will not move a hair's breadth if you run, stoop down, &c. We name a cloak, for a coat is detestable, and wets both yourself and your gun, instead of keeping you dry. With a cloak, you only need to turn it "rear rank in front" if the rain comes in your face, and you may laugh at a storm, for the trousers we before named will keep you dry above the knee.

The Shot-bag and Powder-flask.—For the convenience of carrying the shot-bag and powder-flask, we offer the following suggestions:—Have a thin leather strap sewn tight round the shot-bag, where the charge screws in. Another strap should be sewn to the one named, and continued endways round the bag through the D at the end of it, till it joins the other side of the strap round the collar, where it must again be sewn to that strap, and be continued loose for two inches; and at the loose end there must be a D. When held by the last-named D, the shot-bag will hang charger uppermost. Then have a strap to go round the waist, with a short bit of leather, three inches long, sewn on at right angles. This bit of leather should come on the right hip-bone when the strap is buckled round the waist. We can only say, that any one who will try this plan of carrying a shot-bag, will never return to the old plan of carrying it round the shoulder. The short hanging strap must have a steel swivel to it, to hook into the D of the shot-bag.

The powder-flask should be carried in the

right-hand large pocket below the waist, and the wadding also; because you save one movement in loading, by taking a wadding out when you put your hand into that pocket to return the powder-flasks. Speaking of powder-flasks, we have seen a very simple contrivance for a drinking-cup, by having it made of German silver, or plated, and fitting on to the lower part of the flask. This is the invention, we believe, of a well-known and very excellent sportsman, living in Derbyshire.

TELESCOPES.—There is another article forming the outfit of a shooter; and though the last, it is not the least important part of a field equipment. This is a pocket telescope. Two are sometimes carried, of the following descriptions:—One about fifteen inches long when drawn out, and three-and-a-half when closed; and with it you may, on a tolerably clear day, tell the hour by any church clock at three miles' distance; and it will, consequently, enable you to identify the person of any one you may see poaching at a distance; and it is, of course, equally available on the thousand-and-one occasions when its use may be required in an open country. The price of these glasses, in leather case complete, is about 1*l.* 16*s.* The other glass is about three inches when drawn out, and two inches closed. It has only one slide. The power of this small telescope is extraordinary, and would not be conceived by most persons till tried. The handiest way to have it is to draw it out, in the first instance, to the right focus, ranging to about a mile, and then cut a piece of card that fits round the moving slide, keeping it from pushing in, and have the card stitched with thread so as not to come off. You can carry it thus in a clean pocket on the right-hand side of your shooting-waistcoat, and you are ready to mark birds when they get up, without the loss of a second of time. The relative uses of the two glasses will be obvious to any man who has shot much in an open country. The price of the small one is 12*s.* 6*d.*

Having thus equipped the young sportsman, and treated of the Moors and the Manors, we will, in our next chapter, treat of Shooting, in connection with the modes of handling the Gun and the Dog.

CHAPTER III.

SHOOTING.—THE ONE-EYED AND THE TWO-EYED SYSTEMS; USING THE GUN; LOADING; PRECAUTIONS.

THE theory of shooting involves a complete knowledge of the most advantageous manner of directing the gun when placed to the shoulder, relatively to the game intended to be killed; and as birds present themselves in various ways—flying away from us in a straight undeviating line at one time; at another time descending; sometimes crossing before us either to the right or to the left, or coming directly over our heads—there must be fixed rules for the management of the gun, the accurate knowledge of which may be considered as part of the theory of shooting. These rules must be adhered to or deviated from according to circumstances, as the judgment of the sportsman, matured by experience, may suggest at the moment. For instance, firing at a bird proceeding in a direct straight line, neither rising nor descending, provided the distance do not exceed thirty-five or forty yards, it will suffice to cover it; that is to say, to have the elevated rib of the barrel in a straight line with the bird, so that no daylight be visible to the eye between the sight of the gun and the lower part of the bird, in which case the bird will be hit by the centre of the charge. If the bird, however, be ascending, the gun should be directed slightly above it, and, if descending, below it; and in all cross-shots, and those coming over the head, the gun ought to be directed one or two feet, and sometimes even more, before the bird—the degrees of distance being regulated by the supposed pace of the flight of the bird at the time. But why shoot so far before a bird with a quick-

shooting detonator? Because it is found by experience that, notwithstanding the force and quickness with which the shot is propelled by the best of guns, if the gun be directed at right angles at a crossing bird which is at the distance of thirty-five yards, the charge will arrive too late. The bird has, during the transit of the charge, advanced about two feet through the atmosphere, although, doubtless, a minute portion of time is lost between the pulling of the trigger and the discharge, as well as between the determination to pull and the actual pulling. At all events, from these combined causes of delay, the bird obtains an advance of from one to three feet, the judicious anticipation of which by the sportsman is requisite to success.

A further consideration presents itself as involved in the theory of shooting; and this is in the gravitation of the charge towards the earth. As this tendency, however, is remedied in all good guns by the proper setting of the barrels, the sportsman is under no necessity of making any calculations in regard to it, at least within the distance of forty yards, as all guns, turned out by first-rate makers, are so well put together, that what is termed a point-blank aim may be taken at that distance. This point-blank aim means, that the centre of the charge will hit the object to which the gun is directed, if a correct aim be taken, the rib being elevated in proportion to the length of the barrels and the strength of their shooting, so that the direction of the latter, in point of fact, at a distance of forty yards, is from eight to twelve inches above the line of sight, whereby the gravitation of the charge is remedied.

As the rib is not parallel with the calibre, and as the breech end of the barrels must be sunk into the stock, more or less, according to the thickness or elevation of the rib, it is evident that the elevation of the barrels will be increased in proportion to the elevation of the rib; but it is hardly necessary to enlarge upon so clear and obvious a mathematical truth—as the French say, "*cela saute aux yeux.*" We will, therefore, only make the following short remark, which will obviate all misapprehension: if one straight line be drawn from the rib, and another from the centre of the calibre, to the distance of forty yards, they will be found to be from about eight to twelve inches apart, provided the elevation of the rib and the setting of the barrels be correct.

If all guns were of similar strength in their shooting, the precise degree of elevation might be ascertained to a mathematical nicety, and the gun-maker would have a fixed rule for his guide, irrespective of trials; but this not being the case, proofs must be resorted to, and the rib elevated accordingly. Not that this is always the case, as guns badly set are not unfrequently to be met with, and to which the elevation is insufficient, consequently occasioning much disappointment at all long distances, by wounding and breaking the legs of birds, instead of killing them; and although the sportsman is oftener in fault than the gun, yet, we believe that there are some instances in which the fault is in the gun. In addition to the proper setting of the barrels, and the correct elevation of the rib, the balance of the gun and the peculiar make of the stock, from the locks to the point or tip, merit the attention of the sportsman, especially in a heavy gun. Heavy guns, with the point of the stock bent too much downwards, are apt to deceive the best of shots in quick shooting, and, with moderate shots, create frequent disappointment, especially at the end of a long day's shooting, after much hard fagging. We think the gun ought to balance evenly, when placed on the palm of the hand, immediately past the end of the locks.

Much has been said on the superior advantages of the use of two eyes over one: in fact, some of the advocates of the two-eyed system have spoken very disparagingly, and, as we cannot help thinking, with unbecoming severity, of those who support the one-eyed plan—the latter being represented as slow-coaches, their practice behind the times, obsolete, &c. But is this the fact?—is it true? We think not; and, if we may be permitted to judge from observation and experience, we should say the one-eyed men, *cæteris paribus*, are quite as competent to "fill the bag" as their opponents, simply because we believe each system to have its relative advantages and disadvantages, presuming each party to have guns of similar make and construction, of like setting as to the barrels, and of equal elevation of the rib. But, if guns are badly set, and with insufficient elevation, *then* it must be

readily admitted that the two-eyed man will have a most decided advantage in helping himself to that which the gun-maker has denied him. But, with guns constructed and put together on modern improved principles—with proper setting, sufficient elevation, and peculiar fitness for the use of one eye—it strikes us that the two-eyed man has not all that superiority over his opponent of which he boasts; for, if the one-eyed man occasionally shoots under a rising bird, the two-eyed man must sometimes shoot clean over a bird which is rapidly descending, if he shoots in a wild, hilly, and mountainous country. In a flat level country, we are sensible that this latter case would rarely occur; consequently, *there* the two-eyed man would have the advantage. Having shot many years over an uneven and mountainous country, where there were as many shots one way as the other, and being in the habit of using sometimes one-eye and sometimes both, we must admit having occasionally shot over birds quickly descending when using both eyes, and sometimes having shot under rising birds when only availing ourselves of one eye. Here we allude to snap-shots presenting themselves unexpectedly, in the taking of which the most experienced may occasionally be surprised, and reverse the principles on which they generally act. If, therefore, we may be allowed to judge equally from experience and from observation, we should conclude that neither system is perfect, each being liable to occasional failure; and, if both parties will dismiss *amour propre*, and be candid, we think they will arrive at the same conclusion. The use of both eyes, unquestionably, gives extra elevation—in fact, almost indefinitely so, according to the judgment of the sportsman. But is this necessary, and is it always an advantage? We think not; for, if a gun be properly put together, we cannot see that this extra elevation is required, except for a small proportion of rising shots at long distances; and we believe that the difficulty presented even by these, will be readily overcome by the one-eyed man of experience, who possesses nerve and presence of mind. If the two-eyed system be as superior to the one-eyed one as its advocates insist that it is, why require any assistance from the gun-maker in the setting of the barrels—why have any elevated rib?—as it is evident all this is superfluous and unnecessary for the carrying out of the two-eyed principle. For, if we judge rightly of it from the statements of its most strenuous advocates, they despise the steady old plan of looking along, or in the direction of the elevated rib, in line with the sight, holding their heads above the barrels, and taking their own elevation and line of sight—exercising their own judgment on the spur of the occasion; so that in this speculative system, much practice and experience are requisite, in order to acquire the habit of accuracy and precision. From this, we think, it may be fairly inferred, without illiberality towards the two-eyed men, that their system is not infallible; that they sometimes err, and, consequently, that their practice has not that decided superiority over the one-eyed system which it is presumed to have; as the latter, as far as it goes, is not liable to mistake, and is easily carried out—the precise extent of elevation being already determined and arranged by the gun-maker on unerring principles. The hand will, to a very great extent, follow and obey the eye. We are therefore convinced, that in snap-shots, even at such large birds as blackcocks, when they slip off the high top of a mountain, instantly gliding down below, the two-eyed man would, if he were inexperienced in that sort of shooting, shoot over many more birds than he would ever *hit*. This result, we think, must strike every one, even if experience were not referred to for its confirmation: but let any one, who doubts it, test the point by experiment—bring up his gun quickly to the shoulder, with both eyes directed to a particular object, and he will find, on immediately closing one eye, that the point of the gun is above the object aimed at; and if that object be a blackcock slipping from a high mountain-top, and rapidly descending, he will not only miss his mark, but the charge will be at least three feet over the bird. The one-eyed man would, in this particular shot, have the advantage; because, if a similar experiment be tried with one eye—to that which we have just suggested as a partial test to the two-eyed system—and the gun be brought up quickly to the shoulder, it will be found that the point of the gun will be *under* the object aimed at, and never over it, which, in snap-shots at rapidly descending birds, will

be an advantage which the one-eyed man will unquestionably have over his opponent. This occasion will frequently arise in shooting in the Highlands, at all sorts of game, but particularly at black game, whose flight is peculiar. These birds rarely ascend, even when found on the open heather, or in corn-fields; and not one in twenty rises vertically, but emerges from the heather, corn, or bushes obliquely, and immediately takes a horizontal direction, except when it leaves a high mountain-top—in which case, in the first instance, it descends, subsequently preserving its horizontal course; and when disturbed in cover, always escaping through the first openings which present themselves, emerging horizontally, and never rising vertically, except its horizontal flight be obstructed. Having shot hundreds of these birds, and seen thousands of them on wing at different times, we can speak with some degree of certainty on this point; and if we allude to the peculiarity of their flight, it is merely as illustrative of the position which we have assumed, that all the advantages are not on the side of the two-eyed men. Black game are remarkably easy birds to shoot, when a fair chance can be got at them; but they constantly rise near, without affording the opportunity of a good shot, especially in cover; and this is very intelligible, when their peculiar mode of flight, we have just explained, is considered.

THE GUN AND THE TARGET.

The examination or trial of a fowling-piece is one of those duties so essential, even to the safety of the sportsman, that he must by no means neglect it. Nor must he neglect to make a thorough trial of the instrument which he intends to use, under every change of weather, before he ventures upon the moor or the manor to seek for his sport. In the manufacture of guns there is as much deception as there is in the manufacture of any other articles of commerce; therefore, it behoves the gun-purchaser to bring all his skill and judgment to bear upon the general make of the instrument he desires to purchase, before he has taken it into the field with him. "It is not altogether true," says the *Oakleigh Shooting Code*, "that the best guns are made by the most celebrated makers; but the reason why a gun made by one of these makers is to be preferred by a person not thoroughly conversant with the *arcana* of the trade, is the probable certainty of his obtaining a good one; for a first-rate maker will not hazard his reputation by turning out an indifferent one. The unwillingness, however, to give a first-rater's price, induces the shooter to look out for a second-hand piece; and the eagerness with which second-hand pieces are sought for, has led to a species of deception to entrap the unwary. The following remarks on second-hand fowling-pieces, are by a gun-maker—'Eight out of ten of the guns sold as second-hand are new guns, made up purposely to suit the public taste, or predilection for second-hand guns by a good maker.' And really one might suppose that none but mere novices could be imposed on by them, for they generally bear the names of makers, many of whom were dead before the invention of the copper cap; such as Henry North, W. Mortimer, Fenton, Hewson, &c.; but all these are warranted genuine.

"In making trial of the gun, care should be taken that it is what we will venture to call a thoroughly agreeable piece; that it is easy and pleasant to handle; that it fits the shoulder well; and that it is altogether an instrument that pleases the eye. There is more in this last observation than many would think; for, if the eye is not pleased with the appearance of the piece, good shooting is apt to be marred by it. After the examination, let the breeching be taken out; and remember that the screw, both male and female, be examined carefully; that the male ribs and the female indentations fit so closely together as to harbour no wet; but that, when screwed up, they make a solid mass. This is often little attended to; but, if the amateur will take out the breeches of some of the cheap guns, he will be convinced, by the ill-fitting of these important parts together, of the liability of such guns to corrode, and eventually to burst. We therefore say, buy no gun that shows any marks of disunion between the breech-screw and the barrel; also, look down it against the glare of a large candle, and if any flaw appears, let it be carefully examined with callipers. The breech or breeches being replaced, proceed to an equally close examination of every other part of the barrel. Next examine the stock and its mount-

ings; and, being satisfied of their soundness, strength of parts, and general unity of action throughout, the next step is to try the shooting of the gun yourself. Gun-makers will *themselves* try a gun before you, and many of them will do it fairly; but others have various modes of giving unfair advantages to the gun, and taking them also themselves. In the range, for instance, there are methods of slightly balling the shot, so as to make them exhibit a most tempting garnish. If you are on the premises of the gun-maker, unless he can show a space of fifty yards in length, how can you form an opinion of what may be the killing extent of the range of this, or indeed of any gun you may try there? And even if you are satisfied the piece will carry its shot so far with a fair elevation only, do not fail to mark the depth of indentation the shot make on the wall or target. Without this proof of the strength of the delivery of its charge, the shot may ball among the feathers of the game when you come to use it, but not enter the vitals or break a wing. Let a good-sized trimmer be set afloat, and blaze away at that, having some observant person with you to mark the effects of the shot. Snow on the ground affords a good indication of the range and garnish of a gun, as well as of its elevation, if you actually measure the distance."

THE TARGET.—*An iron target* will be found sufficiently efficient for trying the range, garnish, and force of the shot upon. Chalk it well over, and renew the chalking after each firing. A large linen sheet, or several large sheets of white paper pasted together, should be placed under the target to catch the shot; the figure of which, by being more or less indented, will show the greater or less force with which they were propelled against the iron. The surface of the paper laid down should be considerable, or the rebound of the shot will carry them beyond its limits. The trials should also be varied by using different proportions of powder and shot, not only as regards their own relative proportion towards each other, but likewise as they relate to the gun. Daily trials should also be made under every variety of circumstance; as the modes of loading the gun, of holding it, its state of being clean or foul; and under every atmospheric condition.

For the target, milled-board will form an excellent substitute, where iron cannot be had; and each sheet should be suspended by tenter-hooks against a wall; or, what is still better, to a square or boarding raised on a pole. "The dimensions of the square (or it may be a circle if the trier pleases) will rest with the sportsman; we should recommend one about a foot and a-half, marked off in squares, and the same crosswise, if a circle be employed. The paper, when it is used, should also, like a draft-board, be squared around by chalked lines, drawn an inch and a-half or two inches apart. At proper distances, on the outer circumferences of the target or wall to be shot against, tenter-hooks should be placed to secure the brown paper. Measure off the ground to certain distances, commencing at fifteen yards, and increase each trial by five, until it arrives to fifty yards, with as many more as the trier pleases. As soon as a shot has been made, note the range, the charge used, the number of shot which have entered each *square*, and the depth to which they have penetrated. Chalk over each indentation, and repeat the experiment at another distance."

The *Encyclopædia of Rural Sports* recommends the squares or circles within the circles of the target to be marked in such a manner as to represent the dimensions of the various kinds of game usually shot at. Thus, the first square may be two inches, which will take in the snipe; as that of two-and-a-half may be considered appropriate to the dimensions of the quail; of three-and-a-half to the woodcock and young partridges. Older birds would spread their limits to four inches; the grouse to four-and-a-half; and the pheasant, if a hen, to five; and a full-grown cock would hardly escape any shot that struck within the limits of the square of five-and-a-half. Of course, the tips of the wings of the birds here mentioned might meet with a shot that extended beyond the limits appropriated to it. We only give some clue to a knowledge of what may be expected from the garnish of a gun as displayed on the trial. We have not yet observed, that when much accuracy is required in the trials, particularly if made by an unsteady hand, a "rest" will be a great assistance in gaining a just indication of the shooting of the piece. It is not unlikely that *some*

may call this wire-drawing; we are, however, certain they will not belong to the body of reflecting or experienced sportsmen; they will know better how to appreciate rule, method, and illustration.

LOADING.—Success in shooting greatly depends upon the art of loading properly. The first thing to be done is to squib up the gun several times in order to dry it, and give a little warmth to the barrel, before putting in the load with which you are to begin your day's sport. Your gun is here supposed to be of the percussion make. Having squibbed sufficiently, drawn up the cock, and removed the broken cap, hold the gun in an upright position, and pour in the charge, striking the butt-end of the piece against the ground, to carry down such grains of powder as may be lodged against the sides of the barrel, and also to settle it completely in its place. Now pass down the powder-wadding until it reaches the powder, on which it ought to be very lightly pressed, not rammed. Next pour in the shot, and give a shake or two to settle them evenly and solidly in their bed. Place over them a wadding of sufficient substance and elasticity to preserve the shot in their position; for which purpose give a pressure to the wad, taking care, however, not to ram it hard. It is usual, however, to give the first charge a little more pressure than the charges that are to succeed it. When the powder is wadded, it will be well to observe whether it makes its way into the nipple by the pressure of the confined air, made in passing down the wad. It does not always follow, that if the powder is not seen in the pivot, it will not explode; it is, nevertheless, more satisfactory to see it there; and when this is not the case, we should give the breech a slight tap or two, to introduce it further up the touch-hole. The circumstance of the powder not being seen at the touch-hole, is more likely to happen with the perforated, or serrated waddings, made to let out the confined air, than with those that are entire. The last act of gun-loading is that of putting on a fresh cap, and letting the cock down very gently to fasten it on the nipple.

In charging the flint-gun, it is also prudent to squib it first, and then to introduce the powder and shot into the barrel. Sufficient priming should be put into the pan, but not in such quantity as to allow the pan-cover to crush it. If a double gun be employed, it will be optional with the sportsman to load both barrels alike, or to give, as many do, a somewhat heavier charge to the second barrel, be it right or left, that he usually fires on the longest shots. If the quantities of powder used are the same in both barrels, the size of the shot may, for the second barrel, be a little larger. Many shooters increase the quantity of shot for the charge of the second barrel; but this can only be expedient when the weight of the powder is somewhat increased also; and even then, by many, its propriety has frequently been questioned. It is always more or less dangerous to alter those exact proportions between the powder and shot which experience has pointed out as being precisely suitable to the piece. When a gun has been discharged, the barrel should be loaded while it is still warm; for, when allowed to cool, the moisture begins to settle on its inner surface, and this catches some of the finer particles of the powder-charge, and either decomposes them there, or prevents their falling to the bottom. In either case the detention diminishes the projectile force which is to act on the shot.

What are found to be the just proportions of powder and shot most suitable to his piece, the sportsman should make it his anxious study to discover. A considerable amount of practice will be necessary for this; but it must be done, if he wish to attain to the character of being "a good shot." In experimenting for this, he must make use of different kinds of powder and shot—in short, adopt every method and material that may suggest themselves to accomplish the end he has in view. To achieve all this, requires not only nice observation, but a just mode of reasoning, and the establishment of general rules, and the marking of their occasional exceptions; all of which mental habits are by no means very common among the ordinary run of sportsmen. Hence it is that we find the actual practice of shooting so loose and unscientific; and when a man does succeed in practically acquiring the art in the highest degree, he seldom has the power of correctly communicating his knowledge to others, or of marking, with sufficient clearness, the various steps by which he

has attained a mastery amongst his craft. Between just theories, and accurate practice, there is always a wide gap; and it happens, now and then, that the one is made to throw light on the other.

Many trials must be made with every fowling-piece before it can be fully ascertained what are the proportions of powder and shot that will suit it best, and produce the most pleasant and most effective method of using it. When, however, something like a general idea on the point is obtained, a series of what may be called *small experiments* should be made, in the way of variations in the quantity of loading, that the truth of the general opinions formed may be tested. A detonating piece requires a little less powder than a flint-gun; but the exact difference of proportion between them is not a matter that can be subjected to any general rule; from a fourth to a fifth less is often adopted. Colonel Hawker says—"To load a single gun of six, or double gun of seven, eight, or nine pounds' weight, take a steel charger, which holds precisely an ounce and a-half of shot; fill it brimful of powder, from which first prime, and then put the remainder into the barrel; to this add the same measure bumperful of shot, and then regulate the tops of your flasks and belts accordingly." This, however, is the prescription for a flint-gun, of which the colonel is the ægis. The same authority says, that for a gun of twelve pounds these proportions may be doubled; for one of eighteen, trebled; and for one of twenty-four, quadrupled. Although these proportions for powder be correct, yet the experience of shooters shows that a certain diminution of the quantity of shot should be made for each kind of gun now mentioned. The commonly received regulations are the following:—The sixth part of an ounce of powder for a single percussion-gun, and the seventh for a double. The weight of shot for an ordinary piece of this kind may be one ounce and three-quarters; a much heavier gun will bear one ounce and seven-eighths. For a double gun an ounce and three-eighths may be used for the left barrel, and for the other an ounce and five-eighths. Many sportsmen load the left barrel with less shot than the right, which has to be fired at a greater distance than the first. A young sportsman, commencing to make experiments on the gun he is about to use in the field, should begin with small quantities of powder and shot, notice the effects produced by an increase, and endeavour to ascertain, with the most scrupulous care and nicety, the exact proportions which are best calculated for the make and calibre of his piece. All written rules only serve as general landmarks or finger-posts to direct the way to set out on the journey, but cannot supply the place of well-regulated experiments and accurate observations. It may be remarked, as a leading maxim in game-shooting, that *heavy* loading does not facilitate the sportsman's success. If too much shot be put into a gun, the expansive force by which the charge is thrown out will be disregarded, and, in consequence, both its range and propulsive power will be diminished; if, on the other hand, too much powder be used, it may be ejected, or at least disturbed, before it acts on the mass of shot. Such are the results of experience.

In loading a double-barrelled gun, the ramrod should not be put down one barrel whilst the other is being loaded; because, if a stray grain of shot gets down, it may be so fixed by the ramrod in the barrel, as not to be got out without difficulty; and it may even injure the internal coating of the barrel. After the fired barrel has been re-charged, the piece should be slightly shaken, so that it may be ascertained whether the shot in the right-hand barrel has been removed. If there is heard any vibration of the shot against the sides of the barrel, then the charge must be more firmly rammed down. The slightest vibration will detect the loosened shot.

Mr. Greener, a gentleman of great experience of the gun, says, in reference to the proper charge—"Suppose you begin with two drachms, and vary the charge one-eighth of a drachm each shot up to three-and-a-half drachms, or, as may be required, according to the length and bore of the gun, and, for precision, taking three shots for each charge, at a sufficient number of sheets of paper; whichever you find strongest, with the least quantity of powder, that is the best charge, as very likely the two additions of powder will shoot equally strong, and yet not stronger, because more of it remains unburnt. Therefore the least quantity that shoots equally strong is the

proper charge, which having once ascertained, never change for any other person's plan. In respect to the proportion of shot, all guns, according to their bore and length, will shoot a certain weight and a certain size of shot best. A great deal of shot in a small bore, lies too far up the barrel, and creates an unnecessary friction; and the shot, by the compression at the moment of expulsion, becomes all shapes—a circumstance which considerably affects and modifies its flight. If too great a weight, the powder has not power to drive it with the speed and force required to be efficacious, because the weight is too great in proportion. Those who reason from mathematical calculation will object to this doctrine. They say, the greater the weight the greater the effect. No doubt it is so, if thrown with a proportionate force; but that cannot be obtained with a small gun. We must adapt the weight of projectile force to the power we are in possession of; and from experiments, accurately made and recorded, we find that a fourteen gauge, two-feet-eight barrel, should never be loaded with above an ounce and a-half of shot (No. 6 will suit best), and the utmost powder she will burn. A fifteen gauge will not require more than one ounce and a quarter; and no doubt No. 7 would be thrown by her quite as strong as No. 6 by the fourteen-gauge gun, and do as much execution at forty yards with less recoil; and, setting aside all other reasons, we should prefer a fifteen-gauge gun, if both be of a length, as we should find as much execution at the same distance as with the other."

As we have already observed, however, experience is the best teacher. That, and that alone, is the only true and safe director in the use of the gun.

To shoot a bird when on the wing is a feat requiring great practice, and one which it is sometimes very difficult to accomplish. Sometimes men are, themselves, not always in *proper trim* for shooting. We remember being out on one occasion, on the borders of Perthshire, for a whole day, with a good shot, and, although birds were not plenty, they were not scarce; yet we only killed a couple of brace. On other occasions the same shot was often most deadly. But there are all manner of grades of excellence in shooting; some will feel a degree of self-complacency if they hit one bird in ten; while others will only miss one out of an equal number. A good deal of the proficiency in shooting birds on the wing may be referred to bodily temperament; some persons are so nervously constituted, and so hurried in their movements, that they never attain to the degree of coolness and self-possession requisite for a good and steady marksman. A nervous anxiety shakes their system too violently, and they fire without obtaining any decided aim whatever. The real foundation of the art of shooting flying will be found to be in the sympathy which exists between the eye and the hand, the sight and the touch, and the power of so combining, as it were, the sections of the two senses, that, in their united action, they seem to be the effect of one. The art of measuring distances, and directing objects to a definite mark, are learned by degrees; and so readily is this effected, that very often the best shots are totally unconscious of the internal process which is continually going on in their understandings, when in pursuit of their game. Some sportsmen shoot with one eye shut, others with both open. There is no rule on this matter; it is entirely resolvable into early training and habit in shooting flying. The great desideratum in all failures is a want of coolness; still, many writers say that coolness may exist in excess, and that many birds are lost from the fingers being too slow in their movements after the game is on the wing.

It is good to go through the entire manual training of shooting. To obtain a mastery in this fine art, it is best to begin at the beginning. When we commence to be taught the art of writing, we begin with strokes, and go on progressing, until we have, with practice, completely mastered the art of the caligraphist. So, with learning to shoot, we should commence in such a manner as will gradually lead us to the attainment of the end in the highest possible degree. With this point in view, the following plan has been recommended:—Let the handling and the shouldering of the gun be expertly acquired, in its unloaded state, taking care to look at the height, length of arm, and the inclination of the shoulder of the pupil. This handling of the fowling-piece should be practised for an hour or two for some days, until complete familiarity with all the

required movements is obtained. Expertness in rising or depressing the gun to every kind of level, and taking aim at various objects, should be acquired. Holding the gun firm to the shoulder is a great essential; for anything like looseness and unsteadiness in this particular is entirely incompatible with the art of shooting flying. The left hand should also be placed close, or nearly close, to the trigger—an act which, in a great measure, secures any injury from the bursting of the piece. This precautionary rule is, however, neglected by a vast number of able and expert shooters, who have perfect confidence in their guns; and who maintain, that by placing the hand a little forward, it prevents the piece from being point-heavy, which is apt to cause an unpleasant feeling.

After this initiation has been fairly passed through, the fields should be entered for the purpose of practising at living objects. Firing at martens and swallows has been recommended; but others do not think this to be the best means of acquiring the power of good flying shooting. The movements of these birds are altogether different from those which distinguish game of all kinds. Sparrows having been entrapped, and pieces of paper put round their neck, and then let off, make very good marks. Learn the art of keeping both eyes open. This is, with some, an extremely difficult matter to attain, as young lads are often from infancy accustomed to take aim only with one eye—the right one. These early habits are sometimes so powerful, that it is almost hopeless to expect their relinquishment in after life. "If the young shooter begins to shoot with both eyes open," says Colonel Hawker, "he will save himself the trouble of learning to shoot so afterwards. An aim thus from the right shoulder, comes to the same point as one taken with the left eye shut, and it is the most *ready method of shooting quick*." Celerity of motion should be learned; but the happy medium between *snap-shot* and *dead-shot* should be considered the principal point, and sedulously studied.

A steady and decisive mode of walking and standing is another point requiring great attention in the shooter. An indecisive gait, and everything indicating the slightest degree of hurry or trepidation, are inimical to successful sport. It is said that a firm placing of the limbs greatly assists the arms in readily and gracefully elevating and presenting the fowling-piece. In the regular ranks of the soldiery, we never witness anything like trepidation. There, every movement is performed with the utmost coolness and precision; and the same should be observed by the sportsman in the field. The gun should be carried with the barrel upwards, and sloped towards the left arm, the lock being clasped by the hand of that side, the fingers embracing the stock, which allows the arm, though supporting the gun, to do it with readiness and ease, and to be placed with facility within the grasp of the hand previous to the designed elevation. The points are, "to carry the gun with the cock inwards, and down, and the side of the stock imbedded against the inside of your left arm, taking an easy position, considerably below the chest."

"In the acts of cocking," says the clever author of the *Kunopœdia*, "let your fore-finger quit the front of the trigger, and, extending itself sloping forward through the guard, only feel the side of it with a gentle pressure. Your body, by this action of throwing out the butt, combined with the step-out of the left leg in taking form, will be brought with its weight principally upon that limb; a position assumed as more immediately called for, when the flight is nearly in a line from you, or to the left, which will comprise four out of five of all your shots." Again, when the word *Present!* is used audibly or mentally, let the barrel, at the moment, inclined over the left shoulder, be swept in a circle forwards with a smart motion, the fore-finger of the right hand (sloping, as we have before placed it through the guard, and clear of the front of the trigger) being, as it were, the centre of motion upon which the gun turns during the sweep; by which action the butt should be raised nearly to its full height, and then brought back with something of a thump into its place within the shoulder, whilst, at the same time, an increasing grasp with the left hand, which till now has kept its hold rather loosely, combines with that of the right hand upon the gripe of the stock, to keep it firmly there. The direction of the barrel to the mark, or what may be termed the *line of level*, to be taken, in the first

instance, a little below that which, as already drawn by the eye to the object, we may distinguish by the name of the *line of sight*. The latter should be firm and immovable; to which a precise adjustment of the line of level must finally be made by an easy flexure of the upper part of the body altogether, but without any loosening or twisting of the butt from its firm hold within the shoulder; and on the instant that you get these two lines in contact, or, in other words, at the moment that you bring the muzzle of your gun from your first level below, bear direct upon the object.

In all these directions, examples, or illustrations of them, should be given by the experienced shooter, when the eye of the pupil would far more readily embrace their scope, and the understanding comprehend their application much easier than by any other mode of tuition. Hence, if the tyro can be taken to the field in company with a *tried hand*, or, in other words, a practical sportsman, he will much sooner attain a mastery over his gun, than he will be able to do if he pursues his sport entirely alone, and depending for success only on the necessarily tardy progress of his own experience. However acute may be his unassisted perceptions, his progress will still be comparatively slow; therefore, he should endeavour to court the experience of another, who is an adept in his art, and who, generally speaking, will afford him all the assistance that lies in his power. There is this characteristic of sportsmen—that they are rarely niggardly in giving instruction in the use of the arm in which they take such delight themselves. Their opinions, too, no matter how widely they may differ, are always more or less valuable. They are so much added to the general stock of experience, and afford to the tyro the greater variety to choose from. His own practice must confirm him in the use of the one or the other; and, no doubt, he will act upon the one which, in his judgment, appears the best. In giving his directions to the tyro, Colonel Hawker thus writes, in reference to the movements of the gun:—

"Before an object *crossing*—full high for a bird *rising* up, or flying away very *low*, and between the ears of hares and rabbits running *straight away*; all this, of course, in proportion to the distance; and if we consider the velocity with which a bird flies, we shall rarely err by firing at the crossing bird, when at *forty yards*, at *least five or six inches before it*. As the barrels of double guns usually shoot a little inwards at long distances, there is, so far, a preference in favour of the right barrel for an object crossing to the left, and *vice versâ*; so that, if we were beating along the sides of a hedge, it would be best to keep the barrel next to it in a state of preparation. Till the pupil is fully master of all this, he will find great assistance from the sight, which he should have precisely on the intended point when he fires; he will thus, by degrees, attain the art of killing game in good style, which is done by fixing his eyes on the object, and firing the moment he has brought up the gun. He may then, ultimately, acquire the knack of killing *snap-shots*, and bring down a November bird the moment he tops the stubble, or a rabbit popping in a furze-brake, with more certainty than he once used to shoot a young grouse in August, or a partridge in September."

To young sportsmen, the Rev. B. Symonds says—"When a bird gets up he is certain he cannot kill it (we must premise that his gun is uncharged), therefore he can wait until he gets the bird at the end of his gun. He must never draw unless positive of seeing the bird in that very point of situation. Let it go; every fresh spring of the bird will make the sportsman more composed; and, as the tremor wears off, he will grow more uniform in his manner of getting to it, till, at last, he will cover it almost to a certainty, or very near the same distance. Let him accustom himself not to take his gun from his arm till the bird is on the wing, and never to vary his eye from the very one he first fixed upon. Three words should be mentally used, with a pause between, before he puts his piece to his shoulder; this will keep him, as it were, in awe of himself; and as there is no charm in any particular combination of letters at this time, *Hold! Halt! Now!* may serve as well as any. A day thus spent, he may put some powder in the pan, and flash away in that manner; the next, pursuing the former direction, till he can stare with steadiness, and pull with a wink. The day following, load with powder only; and he

should continue this lesson two or three days, more or less, till he is as calm as if the leather was still in the chaps. Now the grand and last trial—complete loading. If he feels any flutter or anxiety on his advance to the point, let him draw his shot at once; nay, powder also, before he goes up to his dog, and repeat this, *toties quoties*, till he has whipped himself into good temper, and disappointed himself into the accomplishment of his wishes. In cross-shooting, if a bird goes to the left, step forward with the right foot; and the contrary, if to the right hand. This removes at once the complaint often made, of not killing one way so well as the other. Shoot at the head in every direction, if possible; and there cannot be any necessity for greater allowance. In elevation, let the front of the guard be a stop for the gripe of the left hand; in which situation, if the barrel should burst, it will not be so liable to be injured; and the thumb being erect, an avenue is artificially made by means of its corresponding with the cock nail, that gives great direction to the eye. The moment that the eye, in conjunction with the muzzle of the gun, bears upon the object aimed at, fire; for when the eye bears too long on the object, the sight becomes weakened, whilst the object itself is extending the distance between itself and the shooter."

One of the standing topics of discussion among sportsmen, *is the average distance of a fair shot.* Much has been said and written upon this question; and, like all questions upon which much is both said and written, it has become as hazy in some minds as a Scotch atmosphere in the month of November. Forty yards is, however, pretty generally allowed to be a fair average shot; but there are many who kill at almost double that distance. The subject, however, is not susceptible of any determined solution. Most sportsmen know, with tolerable accuracy, what can, and what cannot be done by their fowling-pieces.

A code of laws for the government of parties shooting in company, has been framed, in order to determine what is right and what is wrong practice in the field. In this code, all birds that cross, are to be considered as belonging to the gunner to whose side their heads are pointed, unless a previous understanding was come to, that either party may take an after-shot at a tailing bird. When single birds rise and go away fair for either party, it may be proper to have it previously understood that such should be taken alternately by each shooter.

Precautionary observations are commonly appended to all formal treatises on the gun. These are frequently of great value; yet they are often disregarded; and to the volume of accidents which have already taken place, through carelessness, an additional sheet is every season appended. Even this, however, is far from being a complete record of all that happens, whilst some of them are of the most painful description. The *habit* should be formed to attend to certain minute matters; when this is acquired, it becomes second nature, and affords a firm confidence in the mind of the sportsman himself, as well as in that of his friend.

In reference to the mode of carrying a gun, Mr. Daniel is especially particular. He says, "Always hold the gun with the left hand, close to the guard, and not forward upon the barrel, but strongly grasp it near the entrance of the ramrod, which has been very frequently strenuously recommended. All the requisite steadiness in taking aim, and even of motion, in traversing the flight of a bird, can be obtained by thus holding the heaviest pieces; and, in case of a barrel's bursting, the certainty of having a hand or arm shattered, by grasping the barrel, is reduced to a certainty of escaping some of the effects of such an accident, by placing the hand close to the guard beneath it. With double guns a danger arises, from the shooter, after firing but one barrel, often setting the butt of the gun upon the ground. A sense of self-preservation will soon render it habitual not to do this; and a man who is so absent, or eager, as to disregard this precaution, had better confine himself to carrying a cane, instead of a gun."

The following remarks are worthy of the sportsman's attention:—

1st. If you or your dog should at any time get a severe blow, instantly foment the wounded part for at least half-an-hour with warm water, as hot as can be borne, and you will thereby greatly reduce your sufferings, and also the time you will be kept from your sport.

2nd. If you burn yourself in shooting, wrap the part affected immediately in cotton, the application

of which, like magic, in ameliorating the effects of a burn.

3rd. If you should take cold, and the inflammatory process becomes rapid, bathe your feet in warm water, as hot as you can bear it; if a little salt or bran, or both, be added, so much the better. Get into a warm bed, and take some whey, or whatever can be got to promote perspiration.

4th. Never fast too long, and avoid anything approaching to excessive fatigue.

5th. Never go out with a stomach quite empty, to wait for game of any kind, particularly in the morning. Should you wish to rise early, before any of the household are up, you can have a little crust of bread or a biscuit, with a glass of milk, left for you the night before. This may be taken with a little sugar, nutmeg, ginger, and the yolk of an egg. These items are superior to what is called the "Doctor" (rum and milk), because you then dispense with taking spirit in the morning—a habit that should always be avoided, except you are sporting in a country where ague is prevalent. In this case a little spirit is advantageous.

6th. Never sit down with wet feet, nor with wet clothes on any part of your body. If a change cannot be procured, keep walking about; or, what is better, go to bed, till some dry clothes can be procured; or, if you want to start again, after taking refreshment, first wet your feet with spirit or essence of mustard, and then be as quick as possible in taking your refreshments. Many take the spirit internally, instead of applying it to the feet; but this is invariably bad. Nothing produces chilly and damp kind of feelings readier than spirit taken internally under such circumstances. To keep the frame warm, dry, and comfortable, is the surest plan of increasing your sporting pleasures, and of rendering them really conducive to health.

If all sportsmen were aware of the care which some artists take of not introducing a false hue or shade into their drawings and paintings; or if they saw the care with which good authors criticise their writings, and substitute one word for another, they would surely be much more careful in a matter of infinitely more consequence to themselves. In other words, they would be extremely anxious in looking after all that relates to the use of the gun. When a keeper of the Earl of Chesterfield was preparing for the field, in January, 1789, and stooping to buckle on his spur, as he sat with his gun resting on his knee, and the muzzle close to his cheek, it seemed improbable that a part of the lock should break at that particular point of time; but his instantaneous death was the terrible effect of his not having guarded against what was possible. The muzzle of the gun pointing obliquely upwards, and between the left elbow and left cheek, if the piece fires ever so often by accident, can never do harm; and, from this position, it may be presented with more ease, expedition, and correctness, than from any other. Beware of the muzzle of the gun being kept hanging downwards: when so carried, the shot is apt to force its way from the powder, especially in clean barrels. If it happens that a space of sixteen or eighteen inches is thus obtained, and the gun fired with its point at all inclined downwards, it is ten to one but the barrel bursts. There are other perilous consequences besides the disruption of the barrel; for men, horses, and dogs, are in perpetual danger of being shot when a gun is carried in the before-mentioned pendent manner. In shooting with a stranger, who, perhaps, keeps his gun cocked, and the muzzle usually pointed to the left, plead for the right-hand station, and urge that you cannot hit a bird flying to the left. With a game-keeper, take the right hand without ceremony. In getting over a fence, endeavour to go last, notwithstanding the usual assurance of, "My dear sir, I am always remarkably careful;" and, if a person beats bushes with a cocked gun, get out of his company as a shooter, with all possible expedition. Recollect, both in the house and in the field, always to consider a gun as loaded, and never suffer it to be pointed, for a moment, towards any human being.

Before entering upon the amusement of shooting, we will explain some of the terms used by sportsmen, and with which fowlers only are supposed to be acquainted. The following are the principal phrases:—A *sege* of herons and bitterns; a *herd* of swans, of cranes, and of curlews; a *depping* of sheldrakes; a *covert* of coots; a *spring* of teals; a *gaggle* of geese; a *sord*, or *sute*, of mallards; a *badelynge* of ducks; a *bevy* of quails; a *muster* of peacocks; a *nye*, or *nide* of pheasants; a *covey* of partridges; a *walk* of snipes; a *congregation* of plovers; a *building* of rooks; a *fall* of woodcocks; a *brood* of hens; a *murmuration* of starlings; a *flight* of swallows; a *host* of sparrows; a *charm* of goldfinches; and a *watch* of nightingales.

Having now initiated the young sportsman into all that is necessary for the successful pursuit of his art, we will, in our next chapter, enter into the mysteries of Grouse Shooting.

CHAPTER IV.

GROUSE SHOOTING.—WHAT GROUSE ARE; WOOD GROUSE, OR CAPERCALLIE; BLACK GROUSE; RED GROUSE; PTARMIGAN; LOCALITIES OF GROUSE.

HAVING now treated of all that we deem the most essential matters to be attended to as the preliminaries to the actual sport of shooting, and having given such instructions as cannot fail to be serviceable to those who are desirous of entering the field as sportsmen, and of becoming what are usually called "good shots," we will now enter upon the actual practice of shooting itself; introducing the reader to the different sorts of game which have the magnetic power of attracting the lover of the gun from the mansion to the moor, where, under the influence of fair or foul weather, he is still an enthusiast in the pursuit of his sport. In the sense in which we have just used the word *game*, of course the reader will understand that we mean it to be applied only to such animals as are usually considered so in this country; or, in other words, to such birds and beasts as come under the protection of the game-laws. Such animals as lions, tigers, and elephants, may be accounted game in the eyes of the Indian sportsmen; but as these monsters of the woods and wilds of the tropics have neither home nor habitation in the moors and manors of Scotland and England, we shall have no occasion to make any observations on the best manner of shooting them. Our province lies within the boundaries of our own island; and it is to its feathered and furred wild inhabitants that our remarks will be confined.

WHAT GROUSE ARE.

Sir William Jardine informs us, in his *Naturalist's Library*, vol. iv., that, "by the word *Grouse*, we, in general language, are apt to associate our ideas with the common moor-fowl. But, in the technical terms of ornithology, the generic name, *Grouse* and *Tetrao*, is restricted to those bearing the form of the European wood grouse, dusky grouse of America, &c. They are the largest birds of the family; of a very round and powerful form, and frequent healthy forests in preference to the wild and open moor; perch and often roost upon trees, where young shoots and tender bark supply them with food; and although the legs are plumed with short feathers, the toes are naked. The tail is composed of broad feathers, and is proportionably long and rounded. They are mostly polygamous, and the females and young differ considerably from the males; the plumage of the former being shades of brown and tawny, with black bars and markings; the colours of the latter distributed in broad masses of black, glossy green, or steel-blue, and deep brown. They inhabit North America and Europe; those of the latter country extending into Northern Asia."

THE WOOD GROUSE, OR CAPERCALLIE.

The *wood grouse* (Capercallie, cock-of-the-wood, or giant grouse) is polygamous, and, when incubation begins, the male selects a situation remarkable for its conspicuousness; and here he commences his call which attracts the females, and which he accompanies by throwing himself into various attitudes. This call is described as resembling the word *peller*, *peller*, *peller*, which is answered by the females croaking somewhat like ravens, and rapidly assembling from all parts of the surrounding woods. When this *gathering* has become sufficiently numerous, the male descends from his eminence, introduces himself, and joins the company. His gallantry, however, soon ceases, and his loves do not seem to partake of that romantic or inextinguishable nature which we have known to be exhibited in the history of higher races. When his females commence incubation, he abandons them, and skulks among the brushwood, where he renews his plumage, and leaves his *wives* to hatch, and rear their progeny as they best can. He stands at the head of feathered game in these islands, but he is very seldom to be

met with. From authentic accounts, it appears he once abounded in the forests of both Scotland and Ireland. Bewick describes him thus:—"He is as large as a turkey, and is about two feet nine inches in length, and weighs from twelve to fifteen pounds. The bill is very strong, convex, and of a horny colour; over each eye there is a naked skin of a bright red colour; the eyes are hazel, the nostrils are small, and almost hid under a covering of short feathers, which extend under the throat, and are there much longer than the rest, and of a black colour; the head and neck are elegantly marked with small transverse lines of black and grey, as are also the back and wings, but more irregularly; the breast is black, richly glossed with green on the upper part, and mixed with a few white feathers on the belly and thighs; the sides are marked like the neck; the tail consists of eighteen feathers, which are black; those on the sides are marked with a few white spots; the legs are very stout, and covered with brown feathers; the toes are furnished on each side with a strong pectinated membrane. The female is considerably less than the male, and differs greatly in her colours: the throat is red; the transverse bars on the head, neck, and back, are red and black; the breast is of a pale orange colour; belly barred with orange and black; the top of each feather is white; the back and wings are mottled with reddish brown and black; the scapulars tipped with white; the tail is of a deep rust colour, barred with black, and tipped with white."

The pairing season of these birds commences about the spring, the sexes having assembled together in packs, during the winter, of fifty or a hundred in number. When the pairing has been effected, the female makes a rude kind of nest; she lays from eight to sixteen eggs. The young, like farm-yard fowls, are active, and can run along as soon as they leave the shell; and it is even said that they have frequently been seen *looking after their living*, with part of that appendage hanging to them.

These birds are now rare in this country; but, in some parts of the continent, particularly in Sweden, they form an important item in the game-list. They are commonly, in this country, flushed from the ground in autumn, when they are feeding on a species of berry, of which they are passionately fond. Their flights are but very short; and if there are any trees in the way they usually alight upon the branches. In the forest, capercallies do not always present an easy mark; for, dipping down from the pines nearly to the ground, as frequently is the case, they are often almost out of distance before an aim can be properly taken. No. 1 or 2 shot may answer very well, at short range, to kill the hens; but, for the cocks, the sportsman should be provided with much larger. Towards the commencement, and during the continuance of the winter, the capercallies are generally in packs; these, which are usually composed wholly of cocks (the hens keeping apart), do not separate until the approach of spring. These packs, which are said to comprise fifty or a hundred birds, usually keep to the sides of the numerous lakes and morasses, with which the northern forests abound; and to *stalk* the same in the winter-time with a good rifle, is no ignoble amusement.

There have been various attempts made to re-introduce these birds into Great Britain. The late Mr. Fowell Buxton, and the Earl of Breadalbane, spared neither money nor care to have them reared in this country. But the success attendant on their anxiety has not been great.

THE BLACK GROUSE.

The *Black Grouse* (*Tetrao Tetrix*, Linn.) is a noble-looking bird, and is commonly designated the *Blackcock*, and the female the *Grey-hen*. According to Mr. Daniel, the male bird is from one foot ten inches to two feet in length; but some specimens have exceeded this by three inches. The breadth is about two feet nine inches. The ordinary weight is nearly four pounds; but some stray birds in the moors of Cumberland, have gone beyond this by half a pound and more. The bill is of a dusky black; the eyes dark blue, below each of which there is a spot of a dingy white colour, and, above the larger, one of a bright scarlet. The plumage of the whole bird is very imposing. It is of a shining bluish black, and very glossy over the neck and rump. The coverts of the wings are of a sort of dull brown; the greater are white, which runs along to the ridge of the wings, forming a spot of

that colour upon the shoulder when the wing is closed. The quills are brown; the lower parts and tips of the secondary ones are white, and make a bar of white across the wing. There is likewise a spot of white upon the bastard wing. The legs and thighs are tolerably thickly covered with dark brown feathers, mottled with white. The toes are toothed on the edges, like those of the capercallie. The tail is much forked, and consists of sixteen black feathers; the end of the outer feather, which curves outwardly, seems as if separated or cut off. The feathers under the tail, and the inner covers of the wings, are of a pure white. The female bird is considerably less than the male; having a length only of one foot six inches, and a breadth of two feet six inches. Its weight averages about two pounds. Like the male bird it has a dusky mark beneath the eye. The head and neck are marked alternately with bars or stripes of dull red and black; and the breast has a dusky white and black appearance. The coverts of the wings, the back, and the tail, are of the same colour as the neck, with the exception of the red being of a deeper hue. The inner webs of the quill feathers are spotted with black and white. The inner coverts of the wings are white, and there is a white spot on the shoulder of both the male and female birds. In the latter, the tail is slightly forked, and it consists of eighteen feathers richly variegated with red and black. Under the tail the feathers are white, marked with a few bars of black and orange. The nest on the ground is of the most simple and artless kind. The female lays from six to eight eggs, which are of a dull yellowish-white colour, marked with a number of very small ferruginous specks, and, towards the smaller end, with some blotches of the same hue. They are hatched late in the summer. The young males quit their mother in the beginning of the winter, and keep in flocks of seven or eight until spring. During that period they frequent the woods. In their first feather they resemble their mother, and do not acquire their full plumage till near the end of autumn, when it gradually changes, and assumes that bluish-black colour which it afterwards retains.

The black grouse, like other members of the family, are polygamous; and in January, February, and March, the plumage of the male bird assumes a rich glossy steel blue, which, with his majestic form, imparts to him a very imposing appearance. At the beginning of spring, when the severity of winter has passed, the males, after feeding, may be seen congregated together on some turf-furze, sheep-fold, or rude paling, pluming their wings, and practising various devices to attract the notice of the female. "Here," says Sir William Jardine, "after, perhaps, many battles have been fought, and rivals vanquished, the noble, full-dressed blackcock takes his stand, commencing at first dawn; and where the game is abundant, the hills, on every side, repeat the murmuring call, almost before the utterers can be distinguished. The cocks strut around the spot selected, trailing their wings, inflating the throat and neck, raising and expanding their tails, and puffing up the plumage of those parts, and the now brilliant wattle above the eyes, displaying the beautifully contrasting white under-covers, and imitating, as it were, the attitudes of the little turkey-cock. He is soon heard by the females, who crowd round their lord and master." After incubation is fairly commenced, this fighting among the males is at an end. When the young are hatched, the mother guides them to some high situation where there is plenty of shelter from long grass and luxuriant herbage, and where an abundance of food can readily be obtained. This consists, in summer, of the seeds of the cranberry, crowberry, and blackberry, &c.; and in the winter, of fir shoots, and the catkins of hazel and birch, which impart to their flesh a peculiar flavour, well known to epicures.

The black grouse are to be found in many districts of England—on Leith Hill, Ashdown in St. Leonard's, and in the New and the Bere forests. They likewise abound on the estates of the Marquis of Anglesea, at Beau Dessert, Staffordshire, Barnstable, Devonshire; and in many of the moor districts of Northumberland, Durham, Cumberland, Westmorland, and Yorkshire.

The shooting of the black grouse does not commence till the 1st of September; and they are esteemed as *royal game*. They are generally considered as shy birds; but those who are acquainted with their haunts, find no great difficulty in reaching them. They are partial

to long ling and roughish copse-wood. Under the bank of a deep ravine, particularly in midday, and if there be a cold wind blowing, they will be readily found. The young are comparatively tame till they have moulted; and the sportsman has often almost to kick them out from among low thick brushwood. After they have donned their new coat of feathers, they seem to increase in wisdom and cunning; and frequently bid defiance to the art of the shooter.

Black grouse require full-sized shot; and a single is often preferred to a double-barrelled gun. According to the strict laws of sporting, it is not held good to kill the hen bird.

In Russia these birds are numerous, and they are captured by the use of decoys. Huts, full of loopholes, like little forts, are built purposely in the woods. Decoy birds are placed at a short distance from these spots. These are mere artificial imitations, made of black cloth. As the grouse assemble, the shooters fire through the openings; and if they succeed in keeping themselves out of sight, the birds are not frightened by the mere report of the gun. In this way large numbers are killed. During the winter season, in Siberia, the inhabitants capture them in the following manner:—A certain number of poles are laid horizontally on forked sticks, in the open forests of birch; small branches of corn are fixed to them by way of a lure; and, at a short distance, certain tall baskets, of a conical shape, are placed with the broadest part uppermost: just within the mouth of the basket a small wheel is put, through which passes an axis so nicely fixed as to admit it to play very readily, and, on the least touch, either on one side or the other, to drop down and again recover its position. The birds are soon attracted by the corn on the horizontal poles; and, after alighting upon them, and feeding, they fly to the baskets, and attempt to settle on their tops, when the wheel drops sideways, and they fall headlong into the snare.

THE RED GROUSE.

The *Red Grouse* (*Tetras Scoticus*, Linn.) has the same noble bearing characteristic of his other congeners, and is, in the northern parts of Great Britain, the bird that gives the most shooting of the Grouse family. Its length is about fifteen inches, and it weighs about nineteen ounces. The bill is black, the eyes hazel, and the nostrils shaded with small red and black feathers. At the base of the lower bill there is a white spot on each side. The throat is red, and each eye is arched with a large naked spot. The body is beautifully mottled with red and black feathers, and has a tortoise-shell appearance. The breast and belly are of a purple hue, and crossed with small dusky lines. The tail consists of sixteen feathers, of equal lengths; and the four middlemost are barred with red, and the others are black. The quills are of a dusky colour, and the legs are clothed with soft white feathers down to the very claws, which are of a strong texture, and of a light-brown colour. The female is a little less than the male. The naked skin above each eye is not so conspicuous, and the colours of its plumage, in general, are much lighter than those of the male.

This species of grouse pair in the spring, and lay from five to ten eggs, and occasionally, but not often, twelve. Sometimes these are found on the bare ground, and sometimes on a rude kind of nest, composed of a little heather and moss. This is generally placed in a somewhat sheltered and secluded situation. Both male and female birds attend to the young, and guard them with all the vigilance of which they are possessed, against their numerous enemies, in the shape of vermin, and birds of prey. The young, or *poults*, follow the mother the entire summer, in the same manner as partridges do; nor is the male bird neglectful in watching over the welfare of the brood, although he generally keeps alone, and remains some distance from them. The practice of burning the ling is often very destructive to eggs of the grouse; and thousands are annually destroyed in this way.

The habits of red grouse are not of so wild a nature as are those of others of the same family. Birds of this kind have occasionally been entirely tamed. A gentleman in Ireland had, for several seasons, two brace of birds, so domesticated, that he used to take them into his parlour, where they played with his setter dogs. They are often found descending from the moors, and locating in the vicinity of corn-fields, and sheltering themselves among the stubble, both of barley and oats. In severe winters, when pressed for food, they will leave

the hills and visit the cultivated grounds, and will even, sometimes, be found perched on the tops of the labourers' dwellings.

A bird of this kind ought to be a favourite with mankind—a favourite, we mean, apart from any gastronomical pleasures its flesh may afford. In hunting him, "the light air of the early morning," says Sir William Jardine, "and the free, open, almost unbounded prospect, exhilarate the spirits; while the boldness of the game upon discovery, erectly uttering his cry of warning to his brood—his vigorous, lengthened flight, so as to create doubts of his being again seen—carry with them a continuation of excitement long after it is satiated with following the skulking black game, or the more rural one of waking-up partridges. But, independent of this claim upon the sportsman, it has another. The red grouse is exclusively confined to the British Islands, and has never been found in any part of the continent; and it would be much regretted, if unlimited persecution, or want of preservation, should, in after years, exterminate the bird so exclusively natural."

The shooting of red grouse has been largely handled by different writers; and many minute particulars, as well as contrary opinions, have been laid before the public on the subject.

Mr. Daniel informs us, that in shooting red grouse, the old English spaniel or setter is better adapted to follow the gun than the smooth pointer. The former has a better nose, and his feet are defended by long hair from the chafing effects of the ling, which, in dry weather, cuts like wire. Setters, also, have the advantage of being generally of higher metal than pointers, and exhibit more zeal, and more untiring courage. They require, however, a plentiful supply of water; and this is sometimes a great drawback to their use during the very hot months of August and September. Some gentlemen well skilled in grouse-shooting, take the pointer in preference to any other kind of dog; so that, perhaps, upon the whole, there may be a fair balance of advantages accorded to each kind.

Red grouse differ in numbers and in size, according to the season. Wet, cold, ungenial weather, not only retards the pairing of the birds, but is likewise extremely prejudicial to the hatching of the broods, which, in fine sunny days, take great delight in revelling in the luxury of a pure atmosphere. When they emerge from the shell, they assume, among sportsmen, the name of *cheepers;* and when they advance to a more stately size, they are called *poults*. They are to be found on their feeding-grounds, both morning and evening; but when disturbed, seek out some favourite spot of shelter, chiefly in those sections of the moors which abound with long ling and roughish brushwood.

The time of the year has considerable influence on the habits and movements of the grouse. Frosty weather is favourable for their capture, as they then seem very torpid and lifeless. Wet and windy weather is not favourable to the shooter. At such times the birds leave the high grounds, and seek out sheltered spots in some comparatively dry and secluded localities. Red grouse generally become very wild in the months of November and December; although, when the season is favourable, some good days' sport may still be obtained. The lower and sheltered grounds are then the best places to find them; for the advancing season daily cuts off their resources in food, and they are driven to seek provender in lower and more cultivated grounds.

In rising, grouse almost take a perpendicular direction, and then fly in a straight line, at an elevation of ten or twelve yards. The exact moment to fire, is when they are just about to change from the perpendicular to the rectilinear direction. There is a sort of pause in their flight, which is favourable to the sportsman, when he can avail himself of this movement. But this requires a quick eye, and a good deal of practice. When red grouse begin to associate in large numbers, as they invariably do about the end of October, or the first or second week in November, they are approached with considerable difficulty; for they post sentinel birds to keep a look out, and it is a mere chance if you can get within a hundred and fifty yards of them. When the weather, however, becomes, and continues long cold, this wildness is considerably abated, and they often show themselves as tame as barn-door fowls.

Colonel Hawker directs that, "for shooting grouse, select a fine sunshiny day, from about eight till five in August and September, and

from eleven to three at the later periods of the season, as they are then extremely wild, and will only lie tolerably during the few hours which are favoured by a warm sun. Unless the weather is very fine, you will see them running, and getting up five hundred yards before you. In this case, let one person take an immense circle, so as to head them; while the other remains behind to press them forward when he is ready; and, above all things, you should, for killing them at this time, use either No. 1, 2, or 3 shot, in the largest single gun you can possibly manage; or, what is better, a good stout double gun, with Ely's cartridges. Grouse take a harder blow than partridges, and do not fly quite so regular and steady."

Should a sportsman be solitarily engaged in shooting red grouse, he ought not to travel far, but hunt the ground well. This not only saves much fatigue, but often leads to success. Birds do not generally take very extended flights; and if the ground should be irregular or undulatory, they will commonly be found on the sides of some hill, or knoll, or where the ling is long and strong. They are always variable, even when there is no apparent cause to the sportsman's comprehension for their being so. Their movements depend upon circumstances which are hidden from our scrutiny, and which we have not generally the power to discover. There is always a chance of meeting with birds where the berries of the ling are plentiful, particularly if these localities be visited at a proper time of the day. Noontide is not a very favourable period; but when the mists hang long on the mountain's brow, it is the only time a shooter has to practise his art. Then he should be up and doing. He should range the country in the spirit of one who is not only bent on making his sport a pleasure, but a source of health, heightened by the enjoyment of the beautiful and the grand in Nature, wherever she unfolds those attributes before him. It should always be remembered that the mere amusement of shooting is by no means *all* that is to be obtained from a judicious handling of the dog and gun. The field and the forest, the mountain and the glen, have each its appropriate points of attraction. One has its beautiful kine to gaze on; another its melodious birds to delight the ear; another its majestic form towering up to the sky; whilst another affords a channel to a stream of "sweet waters," that is rolling itself to some distant loch. These are some of the objects to be enjoyed whilst engaged in shooting, with which they should be connected in the mind of every sportsman.

THE PTARMIGAN.

The *Ptarmigan, or White Grouse* (*Tetrao Lagopus*, Linn.), is found in almost every part of Europe, the northern portions of Asia and America, and, some writers say, even in Africa. According to Sir William Jardine, it is spread over most of the Alpine districts of Europe; and is sought for with great perseverance, as, to the inhabitants of these inhospitable regions, it is an actual necessary of life. This bird is nearly of the same size as the red grouse. Its bill is black, and its summer plumage is a pale brown, or ash colour, and the upper parts of the body are mottled with a number of small dusky spots and bars. On the head and neck these bars are broader, and more intermingled with white; as are, likewise, the wings, with the exception of the shafts of the quills, which are black. In the winter season this plumage is changed into pure white, except that, in the male, there is a black line between the bill and the eye. The tail consists of sixteen feathers, the two middle ones being ash-coloured in summer, and white in winter; the two next, slightly marked with white near the ends, and the rest are wholly black. The upper tail coverts are tolerably long, and almost cover the tail entire. Its habitat is found to be on high and lofty grounds, and it can bear the most intense cold. It even lives and thrives amid the snows of Greenland. In Britain it is chiefly found in the Highlands of Scotland, in the Hebrides and Orkney islands, and, occasionally, in the more elevated localities of Cumberland and Wales. Buffon tells us, that it sedulously avoids heat, and loves the biting frosts on the tops of the highest mountains; and when the snow melts on the sides of the hills, it constantly ascends to loftier regions, till it gains the summits on which it forms holes, and burrows in the snow. These birds pair at the same period as the ordinary grouse. The female lays eight or ten eggs, which are white,

spotted with brown. There is no form of nest prepared; they are laid on the bare ground. In winter the birds congregate in flocks; and they are so little accustomed to the devices of the fowler, that they suffer themselves to be easily taken either with the snare or the gun. They feed on the wild and rough produce of the hills, which imparts a bitter taste to their flesh, though it is not by any means unpalatable. It is of a dark colour, and, in taste, resembles that of the hare.

This kind of grouse has attracted the attention of sporting writers, on account of the singularity of its character and habits; and many valuable reflections on the general *harmonies of nature* have been made on the subject. It is contended that its plumage is admirably and singularly adapted to the general appearance of the grounds it frequents. The brown patches of heath, on the rocky declivities of the mountains, are so assimilated to the broken and blended tints of the summer plumage of the bird, that it is very favourable for the purpose of concealment. When the whole country is covered with snow, and presents one extended mass of dazzling white, the dress of the bird is again suited to this change of nature, and greatly assists in its preservation. The plumage is now not only white, but very thick and downy; and even the legs are thickly clothed with feathers resembling hairs, which secure the limbs to the very toes.

As we have already intimated, the ptarmigan family are to be met with in all the elevated and Alpine regions of Europe, and in North America.

"The palaces of Nature, whose vast walls
Have pinnacled in clouds their snowy scalps,
And throned Eternity in icy halls
Of cold sublimity, where forms and falls
The avalanche—the thunderbolt of snow!
All that expands the spirit, yet appals,
Gather round these summits, as to show
How earth may pierce to heaven, yet leave vain man below."

In Greenland they are taken by nooses, hung to a long line drawn by two men, who drop them over their necks. They eat them with train oil, or lard; and their skins are converted into shirts to wear next the skin. The Laplanders take them by forming a hedge with the boughs of birch trees, leaving small openings at certain intervals, and hanging on each a snare. The birds being tempted to come and feed on the buds of catkins of the birch tree, pass through the openings and are caught. In North America, in the territories of the Hudson's Bay Company, and in the neighbouring countries, there are immense numbers of ptarmigan taken every season. And here it is curious and instructive to notice, that as the frost becomes intense, the feathers of the bird, with the exception of those of the wings and tail, become double—a downy one shoots out from the base of each, which provision seems admirably fitted to protect the bird from the piercing effects of the long-continued cold. In the months of October and November, flocks of two and three hundred assemble, and take up their residence among the willows, the tops of which they greedily devour. Hence they are often called the *willow partridge*. We are told by travellers, that their flesh is much esteemed at Hudson's Bay, and in many provinces of North America. Nets, twenty feet square, and supported on poles, are used for their capture; and they are so numerous, that *ten thousand* have been taken from November to April. In the locality of Hudson's Bay, they must, at one period, have been extremely abundant. Sir Thomas Button relates, that in the winter of 1612, he took eighteen hundred dozen of these and other fowl. This capture may surprise us; but the success and appetite of M. Jerome, and his companions, surprise us still more, when it is known that there were taken and eaten, in one winter, between himself and seventy-nine others, 90,000 grouse, and 25,000 rabbits, being about 1,125 grouse, and 312 rabbits *per* man.

GROUSE LOCALITIES.

Even from the general conversation of sportsmen in London, it may be known that grouse-shooting, of which they are so passionately fond, has its locality principally in the north. Being off to the moors, is synonymous to being off to Scotland; for it is there, among the hills, that the grouse is to be found; and, after the 12th of August, the gun may be heard *reporting* its presence with a rapidity that proves the fatal work in which it is engaged. In former days, there used to be found con-

siderable quantities of black grouse in the New Forest of Hampshire, in some parts of Devonshire, Staffordshire, and Derbyshire; but it is now questionable if there be any, either of this species of the grouse family, or of the red grouse, in these parts of England. The moors of Yorkshire are, to the London sportsman, the nearest spots where any portion of grouse can readily be obtained; and even there, for several years, there has been a diminution of their numbers progressively going on. The increase of manufacturing and mining operations in this section of the kingdom, has been the principal cause of this; and, as these are further extended, the birds will retreat still further northward, until they finally locate themselves amid the solitary wildernesses of Scotland.

The cheap and rapid mode of travelling by railway has, however, thrown open to the English shooter, considerable tracts of moorland that were scarcely accessible before; he can traverse the country from London to the distant Highlands of Scotland in a day, and can find moors and game to his heart's content. There are, however, wide ranges of grousing country nearer home. The moors of Westmoreland, Cumberland, and Northumberland, are very extensive; and there are great numbers of grouse upon them, of all kinds. There are, in Westmoreland, shooting districts of immense extent; but the country is so wild, bleak, and mountainous, that a guide is necessary for strangers, and a pocket compass is indispensable. The Cumberland moors are likewise extensive, and pretty well supplied with grouse; but here, too, the country is exceedingly wild and rugged. In the neighbourhood of Hexham, in Northumberland, and in the moors belonging to the Duke of Northumberland, at Keilder Castle, grouse were wont to be plentiful, and the range of country is a very interesting one in point of scenery. England, Ireland, and Wales, however, must yield to Scotland as grousing countries.

This comparatively Alpine land can now, by railway and steamboat, be threaded in all its localities, at a very small cost of time and money. The sportsman can transport himself, in a few hours, from one spot to another, a couple of hundred miles apart; and this gives him a great command of the whole country. If one spot does not come up to his expectations, he can remove himself and establishment to another, an advantage which the grouse-shooters of former times did not possess. Then, a removal to any great distance engrossed nearly half of the shooting season, and was attended with great expense.

To expatiate upon the noble scenery which a Highland shooting excursion presents, is superfluous, as the localities most remarkable for this have often been described by tourists, anglers, &c.; but still, to an intelligent and imaginative grouse-shooter, these mountain peaks and passes must be ever new and full of interest. In many places, the sportsman will find guides indispensable, especially if he wander among the more northern heights, such as those of *Ben-na-buird*, *Cairngorum*, and *Ben-macdui*, which lift their snowy summits to an elevation of nearly four thousand feet above the level of the ocean. An expedition with the gun to any of these parts is quite an adventure, and must be performed on foot; and as there are few cottages to be found amongst them, the sportsman must not forget to supply himself amply with provisions, as the sharpness of the air whets the appetite, and hunger is a bad companion upon the solitary sides of a measureless mountain. Everything here is upon a scale of singularly wild and rugged magnificence. The mountain torrents—some of which are almost one continued waterfall—foam and dash over ledges of rock, and peculiarly affect the mind of the spectator by their grandeur and turbulence. The higher glens are likewise surrounded and hemmed in by rocks and precipices, clothed with the birch and heather, and so far removed from human ken, and human sympathy, that they are seldom visited, save by the red deer and the eagle. Here shooting is both a fatiguing and dangerous amusement; for if the sportsman be a complete novice to such scenes, the chances are that he will tumble over some pointed and half-hidden elevation, and, mayhap, break both his head and his fowling-piece. When less elevated localities are frequented, the shooter will find a small Highland pony of some service. Though attended with care and trouble, it will transport him more easily over a larger tract of country; but where a man is in robust health, and has youth

on his side, there is nothing like footing it, as it keeps him independent in his movements and rambles, improves his health, and exalts his spirits, and enables him to enjoy his sport with an intensity unknown to the pampered body of the luxurious lounger.

We have already observed, that England, Ireland, and Wales must yield the palm to Scotland as a grousing country; but there are in Wales considerable ranges of grousing grounds; and the Black mountains, which divide the counties of Hereford and Brecknock, have some good sporting localities. The country is like the Highlands, wild and rugged, and the sportsman will find some of the higher elevations laborious to reach. The only method, in many cases, is to follow the rough paths of the mountain torrents, which, being dry, afford a kind of winding way to the highest grounds. The picturesque beauty of the country is beyond all description and praise, and must be seen to be duly appreciated.

In Ireland there are some tolerable hills, but they are far behind Scotland, and even some parts of Wales. In the counties of Cork, Limerick, and Tipperary, in the vicinity of the Galty mountains, there are both black and red grouse, with a fair sprinkling of other kinds of game. There is likewise a fair portion of grouse in the Kerry, Wicklow, Clogheen, and Negagh mountains. The moor bird shooting is not quite so fatiguing in the Emerald Isle as it is in Scotland; but the general accommodation is superior in the latter country to that of the former. Ireland is, by some, highly extolled for grouse shooting; while others speak very indifferently of its supplies of this kind of game: but the truth will be found to be, that in some well-preserved localities there is an abundance; while in others, which are equally prolific, there is a remarkable scarcity, arising chiefly from poaching, and indirect means taken to destroy them. In travelling through this country, it has been remarked that, wherever there is a numerous and poor peasantry, game of all kinds is scarce. It can easily be imagined how precious to a half-starved Irishman will a well-stocked preserve of grouse be; and how difficult it must prove for him to keep his hands off them, as a nice relish to his meal of potatoes.

The following remarks of Mr. Lascelles, on the subject of breaking dogs to the moors, and other points, are really so practically valuable, that, notwithstanding their length, we cannot resist the temptation to quote them:—

"An English atmosphere," he observes, "is generally much more favourable to this diversion than a Highland one, as, from the innumerable lochs, and the immediate vicinity of the ocean, the mountains are so concealed in the vapours arising from them, as, at all times, to render a day's sport extremely precarious. A very little will soon cause a grouse to become wild and unassailable; and the chance of pursuing him to any advantage is very uncertain, until, perhaps, in the middle of the day, when the sun may establish a temporary influence. His habits are exceedingly regular, always taking his food and water at particular times; the latter at noon: he will then retire to the sunny side of some bank, and, beneath the cover of high heath, bask in all the delight of imagined security. If a good shot suddenly come upon a brood in this situation, he may, very frequently, annihilate the whole; for they will immediately separate in different directions, and each bird will get up singly, so that he has nothing to do but restrain the ardour of his dogs, and in some measure, also, that of himself. The impetuosity with which many sportsmen, and young ones in particular, travel over their ground, is one great reason why they meet with so little game. They no sooner find a brood, and gain one shot, than they give up any idea of further pursuit, without even marking the progress of their flight, or that of an individual, which may, perhaps, be induced to shorten or vary his, from the infliction of a wound. From the circumstance of heath presenting so continued and smooth a surface, and the little variation in every object upon it, it is more difficult to mark down a grouse with certainty than a partridge; but, by following the course of him carefully with your eye, and afterwards trying in that direction, you will seldom fail of gaining his retreat. It should be a maxim with all sportsmen, never to leave a yard of ground untried which is likely to harbour a bird; by this means you will sooner learn the nature of game of all descriptions, teach your dogs a better system of duty, and give yourself a very

decided advantage indeed, over every other person who pursues a different method. According also to the number of dogs you hunt, at the same time will be your chance of sport; where you possess such a latitude of range, a greater scope is open to your exertions; and, as the fatigue of moor-shooting is much more severe than that of any other amusement, you should endeavour, by every means, to reduce its effects. Two brace of good steady dogs are, in my opinion, the number best calculated for this purpose; and they will work as long as any gentleman ought to continue out. The plan which many sportsmen adopt, is to shoot with one brace of pointers till the time of dinner, and then take a brace of fresh ones for a couple of hours in the afternoon, working the four alternately, morning and evening. The method suits very well with such a system; but there are few men who feel inclined to renew their endeavours after a cool and comfortable repast; and a good fire then becomes a luxury, which we are seldom willing to make so immediate and voluntary a resignation of. Provided every dog be tolerably steady, you can scarcely, in reason, trust too many together; but, where there is a want of discipline, or where it is totally disregarded, it would be absolute folly to use more than one. The opinion which is held by many, of the advantage attending a dog's running up to his game, appears to me a strange subversion of every principle of profit or satisfaction; it totally ruins that cool and even conduct which should characterise a good shot, and excites a contention generally terminating in mutual discontent. The danger, also, is, in many respects, not the least objectionable feature; for, in the anxiety of the moment, you may forget to mark the second barrel; and, should you stumble, which is by no means an improbability, its contents may be lodged in the first object that unfortunately intervenes. I have known an instance, also, where, in the struggle for possession, the thumb of the sportsman had nearly been sacrificed to the consequence of disappointment in his dog.

"There is yet another objection to this mode of breaking, which is, perhaps, still more serious; and that is, the alarm that is given not only to a single bird, but frequently to a whole brood or covey, which instantly take wing, and deprive you of the chance of retarding their flight. I had a dog once sent me which had been broken according to this system; and as there is something rather extraordinary in the mode I pursued to teach him better manners, I will relate it:—He had been shot over two seasons; was handsome and well-bred, with one of the finest noses I ever knew, and as fleet as a fox-hound. The morning when I first had him, which was in September, I took him out alone, and had the good fortune (for it was a very scarce county for game) to find a covey almost immediately; he pointed a moment, and then ran in; but the birds separated; and the first I afterwards shot at fell within thirty yards on the opposite side of a wall. I was, perhaps, long in getting over; and when I did, Beau had not only swallowed the bird, but the feathers also. To begin a new system of discipline would, I thought, then be premature, as we were scarcely acquainted, and I had the rest of the birds all marked down. I got five more single shots, and killed four, luckily in ground where we were upon more equal terms; the fifth, which went away wounded, *he* followed with all the impetuosity of unrestricted desire, and actually took a gate flying, and gave tongue like a spaniel; in truth, I never in my life saw more determined lewdness. At that moment I was very much in want of a pointer, or I should not, most likely, have taken the pains with him I did. For the remainder of the month, and the whole of October, I took him out, at least, five days in every week, with one single steady old bitch that would do anything I bade her; he never was, in the least degree, tired or distressed; no country was too dry for him, nor any covert too strong; and he gave such decided proofs of natural excellence, that I used every endeavour to restore its lustre. I began with severe measures, for he was grown too old in iniquity to hope any success from mild treatment. I tried excessive flogging for a fortnight, but that had no effect whatever; in addition to this, I made use of a long trash, which a boy laid hold of whenever I fired, and who not only checked his impetuosity, but corrected him well at the same time, for displaying it. So long as he was under this immediate restraint he was more cautious of offending; but from the instant it ceased, he resumed his former habits. I

next tried a very sharp spiked collar with cord attached to it; and to have him at all times within reach, I loaded him with shot, by hanging about two pounds round his neck, so that he might be said to be in a constant state of exertion. Finding, however, that all this was mere trifling, and that after reducing the length of the cord to about two yards, and fastening the end to the middle of a good strong hazel—which had the effect, at any extraordinary or improper exertion, of pulling him completely over—I had not the most distant prospects of remuneration, I was at the point of yielding to necessity, when a circumstance happened, which gave me an opportunity, once more, of trying how far this insubordinate spirit might be reduced. The old bitch began to show symptoms of approaching desire; and, during the period of their amour, I allowed him a perpetual and unlimited intercourse with her, keeping him, at the same time, low in flesh, and taking them both out together as usual. In the course of a couple of days, I found so decided a change for the better, that I persevered more diligently in the plan of restriction; which, at the end of a fortnight, so completely succeeded, as to leave me in possession of an animal which, of his kind, was the very best I ever saw. The produce, also, of that litter was invaluable, and required less breaking than any dogs I ever was master of."

As sportsmen often make presents of game, it is very necessary to know how they should be preserved and packed, so as to keep them agreeable and sweet until they arrive at their destination. Mr. Thornhill says—"If you wish to send your game to any distance, never draw it, particularly a grouse; that is, do not follow the usual directions of taking out the entrails. The best mode is, not to pack them until they are perfectly dry First of all, procure bladders, and put a brace or more in one, if the bladder will contain them; tie the bladder tight round the neck, and seal it with sealing-wax, to prevent the air from getting in; and, in that state, if they are put into boxes, they will keep for three weeks, if required." The compiler tried this experiment last year, and found that it answered better than any mode he had ever before made use of. He sent a gentleman some game from Cumberland to London, packed as described; and the gentleman not being at home, it lay in the box till his return, which was fifteen days after its arrival; and this gentleman assured him that he was surprised to find, on eating it, that it was as good as if killed only the day before, and was perfectly sweet, although the distance it went was nearly three hundred miles. Colonel Hawker says—"To send grouse any distance, put pepper to the parts where they have been shot, as well as into their mouths; then pack them, carefully separated from each other, and kept as air-tight as possible in boxes of hops."

CHAPTER V.

THE PARTRIDGE.

The partridge of Britain (*Tetrao Perdix*, Linn.) is of two kinds; the one is the grey, or common partridge; and the other is sometimes termed the French partridge. Bewick thus describes the common partridge:—"It is about thirteen inches in length. Bill light-brown, eyes hazel; the general colour of its plumage is brown and ash, beautifully mixed with black. Each feather is streaked down the middle with buff, and the sides of the head are tawny. Under each eye is a small saffron-coloured spot, which has a granulated appearance; and between the eye and the ear there is a naked portion of skin, of a bright scarlet, which is not very conspicuous except in old birds. There is a crescent on the breast, of a deep chestnut; and the tail is short and drooping; the legs are a greenish white, and furnished with a small knob behind. The female has no crescent on her breast, and her plumage, in general, is not so distinctive and bright as that of the male. The moult takes place once a year." It was long a received opinion among sportsmen as well as naturalists, that the female partridge has none of the bay feathers on the breast, like the male. This, however, on dissection, was proved to be a mistake; for Mr. Montague, happening to kill nine birds in one day, with a very slight variation as to the bay mark on the breast, was led to open them all, and found that five of them were females. On carefully examining the plumage, he found that the males could only be known by the superior brightness of colour about the head; which alone, after the first or second year, seems to be the mark of distinction. Partridges are chiefly found in temperate climates, the extremes of heat and cold being equally unfavourable to them. The female lays from fourteen to eighteen or twenty eggs, making her nest of dry leaves and grass, upon the ground. The young birds run as soon as hatched, frequently encumbered with a part of the shell attached to them. The affection of the partridge for her young is peculiarly strong and lively; she is also greatly assisted in the care of rearing them by her mate; they lead them in common; call them together; gather for them their suitable food, and assist in procuring it by scratching the ground. They frequently sit close to each other, covering their offspring like the common hen. In this situation they are not easily flushed: the sportsman who is attentive to the preservation of his game, will carefully avoid giving any disturbance to a scene so truly interesting; but should the pointer come too near, or run in upon them, there are few who are ignorant of the confusion that follows. The male first gives the signal of alarm by a peculiar cry of distress, throwing himself, at the same time, more immediately in the way of danger, in order to mislead the enemy: he flies, or rather runs along the ground, hanging his wings, and exhibiting every symptom of debility, in order to decoy the dog, in the too eager expectation of an easy prey, to a distance from the covey. The female flies off in a contrary direction, and to a greater distance; but returns soon after by secret paths; and she then commonly finds her scattered brood closely squatted among the grass, when she collects them with haste, and leads them from the danger, before the dog has had time to return from the pursuit.

The partridge subsists chiefly upon grain, along with small seeds from other plants. Her nest is made on the ground in grass fields, among standing corn, in clover, in furze, and sometimes even at the top of a ditch. The eggs are generally laid in the month of May; and, from this time to the latter end of June, the process of nidification takes place. In all the stages of this natural process, the male bird takes a certain share. When the brood is hatched, he manifests the greatest solicitude, and leads them abroad in search of ants' eggs, and larvæ among insects. His call is in

a sharper key than that of the female. Naturalists have noticed that the two birds have various notes or cries, as if to distinguish their several states or conditions, as to safety, food, or danger. When they settle down in the evening, their *jucking* is well known. Mr. Lascelles tells us that he has often watched their movements, and listened to their cries for hours; and always observed the male bird even more solicitous, in appearance at least, than the female, for the provision and protection of the brood. This care, however, is left to the female as soon as the birds are able to fly. Even then her watchfulness continues, and, indeed, seems increased. She is never far from them, but searches for food for them, and takes them abroad to their scratching-ground; and when they seem tired, she gathers them all around her with great care. When they are about their full size, or within a third of her own bulk, they are left, in a great measure, to shift for themselves.

PARTRIDGE SHOOTING.

There is no sport in which the gun is employed as the instrument of amusement, so fully and so universally practised as the shooting of partridges. It is more homely and domestic than moor shooting; and can be enjoyed by those whose strength and age render them less capable of pursuing sports requiring greater physical exertion. The successful prosecution of it must, necessarily, vary with the numerous circumstances under which it is enjoyed. If a sportsman has a limited estate with which he is well acquainted; if he has himself taken great care of his coveys of birds; knows their haunts, their times of feeding, and resting; if his enclosures are small, and well fitted for the birds taking short flights; if these, and many more minute and favourable matters fall to his lot, his sport may, *ceteris paribus*, be reasonably expected to be much superior to what a mere stranger to the locality would find. There are scarcely any two shooting grounds, or any two sportsmen, that can fairly be put on a par with each other, in all their diversified characters; therefore it is that so many varied accounts are found of the sport, and so many different adventures encountered in its prosecution. Every shooter has a history or tale of his own to tell; he has joys and sorrows with which strangers do not interfere; and he lives and moves in a little world of his own creating.

Distinguished sportsmen inform us, that the *footing* of partridges, though a very requisite qualification in pointers, is one of the last things that should be expected from them, as they are not to be relied on until they fully comprehend from the sportsman that they are not to *catch* the bird; and that they are only required to *point out* where it is. It is well known that partridges will generally lie closer and better to dogs that *wind* them, than to such as *track* them. The reason assigned for this is, that when they are winded, the dogs do not go straightforward towards them, but follow the scent left by their devious course. When birds see dogs tracking their footsteps down the wind, they will fly off, for their scent cannot be caught by the dog till he is near them. Another matter is of some importance in commencing partridge shooting in September; and that is, that dogs brought immediately from the moors, and put upon the hunting of the partridge, are in many instances, for some days, unfit for their duty, till they are again *broken-in* to their new task. The hunting of grouse in the moors is altogether a different operation from the work to be done in the fields in September. A dog that is really well trained will soon find himself at home in both occupations; but when this is not the case, there will always be more or less of disappointment experienced from the sudden transition from two such opposite conditions of life.

It has been recommended, that to be early in the field is necessary for any one who desires to secure a good day's sport at partridge shooting; but here Colonel Hawker steps in and says, "that he never saw much execution done before breakfast." To this it has been replied—"True; but without putting ourselves to the expense of sending two or three sturdy fellows to warn off intruders, if the birds have escaped being killed by that time, they are certainly dispersed abroad; and the advantage of our knowing their feeding and basking grounds is nullified." However this may be, we believe it is a general opinion amongst the experienced that the colonel is correct. If it were possible to take anything like an accurate census of the success of sportsmen in partridge

shooting during the months of September and October, we think it would generally be found that the most productive hours range from eleven till three in the afternoon. Of course general rules of this kind cannot be laid down but with many reservations: we believe, however, the result of a test of this kind would establish the truth of the point without any doubt. There are other advantages, however, to be realised by the early-rising sportsman, unconnected with the capture of game. The habit induces good health, and tends very much to strengthen and preserve it. It has an excellent and sustaining effect on the animal spirits; and these are by no means of slight consideration. After the month of October, and from this to the end of the partridge season, we should not insist on being earlier in the field than about mid-day; as, after this period, the weather becomes lowering in the fore part of the day.

Both the weather and the season have a great influence over the birds, as well as the state they themselves have been in, relative to quietness, from previous fowling excursions. The flights they take vary with the nature of the country in which they are bred. Where the enclosures are small, and the general aspect of the country undulating, short flights are taken; but, where the fields are large, and the landscape open and level, the birds will often take a mile or two at one flight.

As a general rule, it might be asserted that a prudent sportsman will not injure his diversion by following the birds every day in the same track. Relative to the shooting of partridges in windy weather, too, there is great difference of opinion. The weight of argument, however, seems in favour of those who maintain that this kind of weather is not, upon the whole, favourable to sport. Indeed, when it is boisterous, it can only be favourable under one view, and that is on account of birds not so readily hearing the approach of the sportsman. It may likewise be observed, that in a high wind they seem bewildered, and will often lie so close as to afford good sport; but then it is again found by experience, that for one windy day, when they will lie like stones, they will, other ten days, be as wild as hawks, particularly if there be showers of rain with the wind. In the latter case they generally betake themselves to the woods and to furze; and cole-seed is said then to entice them. In Ireland, partridges, in a high wind, uniformly make for the potato fields. In weather of this kind, the sportsman should always take the windward side of his beat, otherwise he will run a chance of driving them off his ground, and into the hands of other parties who may be abroad on the same mission as himself.

In the practice of mid-day shooting, it may be laid down as a common rule, that, in ordinarily fine weather, the birds leave their feeding localities about ten o'clock in the month of September, and eleven in October; but after this period, their movements become less regular, so that no calculation relative to their movement can be depended on. This has been attributed to the variable weather to which a Scotch climate is subject, and to which all things living in wood or wilderness must be subservient. When there is a rapid succession of rain, sleet, snow, wind, and sunshine, we have a variety of disturbing causes operating on both the sportsman and the birds; therefore any universal rules must, in such cases, prove almost entirely useless. The stubbles may be tried in mid-day, sometimes with advantage, for the birds do not always leave them for basking grounds. These stubbles are the principal feeding localities; and as the day advances, birds are almost sure to be found at one time or another. When birds of prey appear, coveys will often disperse, which is favourable to the sportsman. One bird will perhaps take shelter near a clod of earth; another will run behind a tuft of grass or a low piece of copse; and a furze-bush may shelter another. Sometimes, in the latter end of the season, the partridge will be in foul lands—such as are left in a rough state before the agricultural operations of spring commence.

Among partridges, there are always more cocks than hens; and this often tends to check the breed considerably. The hens are so tormented by the numbers of males, that they drop one egg in one place, and another in a different spot. It is said, the best mode to destroy the superabundance of males is, during the first three weeks of the season, to net the covey, and destroy all the old cocks, leaving as many young hens, and even one less; for it is certainly better that the old hen should look for the cock, than a number of cocks run

after one hen. It should be recollected, that where old birds are left, they will, at the pairing season, drive off the young ones, and prevent their breeding; for, let any sportsman declare if ever one find a brace of partridges in the shooting season that have not bred (and are termed by sportsmen a *gelt pair*), whether he has not found a covey near the same place—a circumstance which can only be accounted for by the old birds driving the young ones from the ground, and preventing their breeding there. It is, therefore, a wrong notion that some birds should not be killed every year; and those gentlemen who have manors, will find, that by not allowing some to be killed, in a short time their grounds will be entirely destitute of game. The late Earl of Kingston had a great quantity of grouse on his mountains in Ireland before they were preserved; but he thought that, by leaving them quiet for a couple of seasons, he should have had a much greater abundance; he therefore did not allow a shot to be fired on those mountains for two seasons; and, it is well known, they were carefully preserved during the whole time. On collecting, however, a large party the third season, and going out to grouse, many of the gentlemen who had been in the habit of shooting there prior to its being preserved, were surprised to find so great a scarcity. The reason of this was, that the older birds had driven the young ones off, and all the mountains adjoining his lordship's preserves, were swarming with game, although they had not been preserved.

The principle of *domesticity* is not very strong in the partridge. Those birds which have been reared under a common hen, soon manifest their dislike to restraint; gradually become wild, and eventually fly off altogether to enjoy their native freedom. We have heard of one being reared by a clergyman, which became so tame that it would come to the parlour window to receive its breakfast, and would, also, occasionally enter the house. It was not, however, completely domesticated.

It is generally said, that *broken coveys yield the best sport;* and that, while the young birds have the old ones with them, they are "up to every move on the board;" but when deprived of their natural leaders and protectors, they seem lost, and have no settled idea of safety. This is the fortunate time for sportsmen to make play upon them, and press the dogs to their duty in tracing them from one spot to another.

As the season advances, the size of the shot to be used for partridge shooting should be enlarged. For the first fortnight, Nos. 5 and 6 are recommended; after this, Nos. 4 and 5. In October, No. 3 will be found the most eligible.

RED-LEGGED OR GUERNSEY PARTRIDGE.

This is the *Tetrao Rufus* of Linnæus, and is often called the French partridge. It is larger than the grey, and the bill and irides are red. The forehead is grey brown; the hind head is rufous brown; the chin and throat white, encircled with black; and there is likewise a band of white over each eye to the hind head. The fore part of the neck and sides of it are cinereous, with two spots of black on each feather, and the hind part of the neck is rufous brown. The back, wings, and rump are of a greyish brown; the breast, pale ash colour. The belly, sides, and thighs, are rufous; the sides marked with lunular streaks of white, black, and orange. The quills are grey brown, with the outer edges yellowish. The tail is composed of sixteen feathers; the four middle ones are rufous on both sides. The legs are red, and the male only, has the blunt knob or spur behind. Mr. Daniel says, that it is a common pastime in the Isle of Cyprus to use these birds as we do game-cocks, for the amusement of the people. This partridge is abundant in most parts of Europe, Asia, and Africa; in many parts of Italy and France; and also in the islands of Madeira, Jersey, and Guernsey.

Surprising stories are told of their numbers in some countries. In the Isle of Nansio, they are so common as to amount to a positive nuisance. The inhabitants make a rule to collect as many eggs as possible every year, in order to lessen the breed, which, in some seasons, have been so numerous as to have eaten up the entire produce of the harvest crops. These eggs, which are taken by thousands, are prepared with different sauces, and supply the people for a considerable time. Tournefort says that partridges are so tame in the Isle of Scio, that they are driven to seek

their food in the fields, like so many sheep, and that each family entrusts its partridges to the common keeper, who brings them back in the evening; and he calls them together with a whistle, even in the daytime. Another account states that, in the country around Trebizond, a man was seen leading above four thousand partridges; he marched on the ground, while the birds followed him in the air, until he reached a certain camp, three days' journey from Trebizond; when he slept, the birds alighted to repose around him, and he could take as many of their number as he pleased. We are told that, in Provençe, in France, persons have acquired the art of assembling numerous flocks of partridges, which obey the voices of their conductors with wonderful docility. Willoughby mentions, that a man in Sussex had, by great skill and attention, made a covey of partridges so tame, that, for a wager, he drove them before him, from that county to London, although they were free, had their wings fully grown, and in right feather.

The red partridge takes up its habitat in mountainous regions, well covered with wood. Its flesh is tender and white, and, by many gastronomes, is considered of a richer flavour than the flesh of the grey partridge. The French make it into pies, which are highly esteemed. From the common partridge it differs in its habits, from being found in flocks; while the other species are only known in coveys; and the red bird perches likewise on trees, which the ordinary bird never does.

"So far back as the time of Charles II.," says Mr. Blaine, "several pairs of these red-legged partridges were turned out about Windsor, to obtain a stock; but they are supposed to have mostly perished, although some of them, or their descendants, were seen for a few years afterwards. The late Duke of Northumberland preserved many, in the hope of their increasing upon his manors; but the late Earl of Rochfort, and the Marquis of Hertford, were at the most expense and trouble to establish them in this country. Both of these noblemen had not only numbers of the birds sent over from France, but, also, at a proper age: by this means there are now plenty of the red birds upon the latter nobleman's estate, near Orford in Suffolk." These birds, however, are not so agreeable for the table as our own native partridge; nor do they afford sport equal to that afforded by the other.

"September comes to cheer the fowler's heart,
And raise his anxious hopes; day after day
He marks the fruitful country change around,
With eager eye. First, from the fertile meads,
Divested of their widely waving load,
The pregnant hay-rick rises. Gentle swains,
If chance should lead you to the chosen spot,
Where the shy partridge forms her simple nest,
The embryo offspring spare; and when your scythe
Levels the grassy valleys, should your foot
Approach the helpless brood, step back with care,
Nor our fond hopes destroy."

We will close this chapter with an extraordinary account of the enemies of game, captured a few years ago on estates of the Marquis of Ailsa. It is taken from the columns of the *Inverness Courier*:—

The Marquis of Ailsa has, for some years, encouraged his gamekeepers in the destruction of vermin, by paying so much *per* head for those brought in. Every keeper and assistant-keeper has a record of all the vermin killed by him; and receives payment every three months accordingly, besides the regular and liberal wages to which they are entitled for their services. All kinds of vermin were thus brought low—even to the jackdaw and common rat, which, we are informed, caused great destruction to the eggs of pheasants and partridges. The rat has become very common there, and is found to burrow in rabbits' holes to such an extent, that, in ferreting rabbits, it sometimes happens that a rat and a rabbit are shot right and left. Whole broods of young pheasants and partridges have been found dead, and partly eaten, near rats' holes, and sometimes even young hares and rabbits. The owl, generally supposed to be harmless, has been shot with young game in its talons; and hedgehogs have been found with large accumulations of egg-shells in their burrows, or in the long grass where they coil themselves up, and have always been taken in traps baited with rabbits, hares, or wood-pigeons. Adders are included among the vermin to be destroyed on the marquis's property, but we believe they do not injure game. In four years and a-half, the sum paid on the estate of Culzean and Craiglure moors, in Ayrshire, for vermin destroyed by the keepers, amounted to £231 15*s.* 10*d.*

CHAPTER VI.

THE PHEASANT.

THERE are two sporting varieties of the pheasant—the *phasianus colchicus*, Linn.; and the *phasianus torquatus*, of Temminck. They interbreed, however; and from this circumstance it has been supposed, by naturalists, that the difference between them arises more from accidental causes than from any law determined by the will of nature.

Bewick describes the common pheasant as being two feet eleven inches in length. The bill is of a pale horn colour, and the nostrils are hidden under an arched covering. The eyes are yellow, and surrounded by a space, in appearance like scarlet cloth, finely spotted with black. Under each eye there is a small patch of short feathers, of a dark glossy purple; the upper sections of the head and neck are of a deep purple, inclining to glossy green and blue. The lower parts of the neck and breast are of a reddish chestnut, with black indented edges; and the sides and lower portion of the breast are of the same hue, with rather large tips of black on each feather, which, in various lights, vary to a glossy purple. The belly and vent are dusky; the back and scapulars beautifully variegated with black and white, or cream colour speckled with black, and mixed with deep orange on all the feathers, edged with black. On the lower parts of the back is a mixture of green; the quills are dusky, freckled with white. The wing-coverts are brown, glossed with green, and edged with white; the rump is a pale reddish brown, and the two middle feathers of the tail are about twenty inches long; the shortest on each side less than five, and are of a reddish brown, marked with tranverse bars of black. The legs are dusky, with a short blunt spur on each; but in some old birds, the spurs are sharp as needles, and between the toes there is a strong membrane. The female is a good deal less, and is not gifted with that variety and brilliancy of plumage which characterises the male. Her general colours are light and dark brown, mixed with black; the breast and belly are beautifully freckled with small black spots on a light ground; the tail is short, and barred, somewhat resembling that of the male, but not so strikingly interesting; the space around and about the eye is covered with feathers. The common pheasant is generally found in low and woody localities, on the borders of plains, on which they delight to gambol and sport; during the night they roost on the branches of trees. They are distinguished by a great shyness, and do not associate much together, except during the months of March and April, when the male is in quest of the female; they are then easily known by the noise which they make in crowing and clapping their wings, and which may be heard at a considerable distance. The hens make their nests on the ground, like the partridge, and lay from twelve to fifteen olive-coloured eggs, which are smaller than those of the domestic hen. The young run after the mother as soon as freed from the shell. During the breeding season, it has been often ascertained that the cock pheasant will intermix with the common hen, and produce a hybrid breed.

Sir William Jardine, in his *Naturalist's Library*, tells us, that it is now generally admitted that the pheasant was originally introduced into Europe from the banks of the Phasis (now the Rioni), a river in Colchis, in Asia Minor. The Greeks, in the ascent of the stream, were attracted by their beauty; and the bird being so easily domesticated, a valuable addition to the luxury of themselves and Romans was soon secured, and rapidly extended itself over the southern countries of Europe. They appeared at the expensive and superabundant repasts of the ancients; and, for a time, bore the palm for novelty; and Heliogabalus, in his ostentatious displays, is said to have fed the lions of his menagerie with them. The pheasant may be said to have been originally restricted to the Asiatic continent, extending over the greater part of it, and reaching to China, and the confines of Tartary.

In Siberia, the pheasant is also abundant; and, though not originally belonging to the American continent, has been introduced to it. They are, however, not very well adapted for moving from place to place, on account of the shortness of their wings. From this cause, we are informed that they are kept in complete imprisonment in the Isolo Madre, in the Lago Maggiore, at Turin, as they are not able to make their flight over the lake. When they make the attempt they generally perish. It is stated by Sonnini, and other travellers, that the pheasants of some of the northern islands of the Archipelago, and which come thither from the woods of Thessalia, are larger and handsomer than those of other countries; and that it is a great source of amusement among the Turks, to let birds of prey, which they carry in their hands, fly at them. When the pheasant takes its flight, the bird of prey, which they let loose, hovers above it, and compels it to perch on some tree. The former then places itself on another branch, over the head of the pheasant, and keeps it in such terror, that it suffers itself to be approached, and taken alive. This fact, it is remarked by Sonnini, sufficiently develops the mystery of fascination.

As a bird for the table, the pheasant is extremely salutary. When ancient physicians made comparisons as to the wholesomeness of any viands, the pheasant was always chosen as the standard of excellence. The hens are the most juicy, and, in every way, preferable to the cocks; still the true sportsman will never kill a hen if he can help it. They are sweetest roasted; and the best mode of dressing a cock is to stuff him with the lean of the inside of a loin of beef cut into pieces, the size of dice, and well seasoned. The gravy issuing from the beef gradually diffuses itself over the flesh, and renders it less dry and hard than it is when destitute of this supply.

Exclusive of the common pheasant, there are six other varieties; namely, the gold, the silver, the ring-necks, the white, the pied, and the Bohemian.

That the ring-necked pheasant and the common pheasant interbreed has been denied, or at least doubted, by several naturalists of note. The ring pheasant, it is said, is a native of China, where the common species are very abundant; but there is nothing to establish the fact that it interbreeds with the common pheasant. The eggs of the ringed bird are of a pale-bluish colour, and marked with small spots of a deeper tint; while those of the common pheasant are of an olive white, and are destitute of any spots. In a wild state the ringed species are uniformly less in size than the common bird, both in length of body and in tail. The head of the former is of a whitish fawn colour, tinted with bluish green; and above each eye there are two white lines, which constitute a sort of eyebrow. The marking in the back of the ringed kind is different and smaller; and the rump feathers display the same peculiar tints which the mixture of fawn and greenish blue exhibits. But the most distinctive mark of difference is, that the white ring is broadest upon the sides of the neck—a circumstance which cannot be overlooked in considering this question of identity. The female of the ringed pheasant is likewise less than the female of the common kind, both in size and in length of tail. The entire question, however, of distinction, is not by any means satisfactorily settled. Sir William Jardine says—"The pheasant sometimes also crosses with the domestic fowl. M. Temminck mentions this as requiring great attention to accomplish; but, where poultry are kept upon the borders of a wood abounding with pheasants, it occasionally happens, and would do so more frequently if favourable opportunities occurred. A specimen in my own possession, exhibiting all the mixed characters, was procured in a wild state. M. Temminck also records a solitary instance of a mule between the female pheasant and male golden bird, which exhibited a curious but splendid mixture; all his endeavours, however, to procure a second specimen were ineffectual. The common pheasant also breeds freely with the ringed bird, and the offspring is productive. This has been considered by many as a proof that these two birds were identical; but, in the whole of this order, and its corresponding one among quadrupeds, this law has a much more extended modification, and can scarcely be taken as a criterion, except in very opposite instances."

The rearing and preserving of pheasants forms an interesting branch of sporting science. The bird being naturally strongly averse to domestication, it is subjected to many casual-

ties which lessen its numbers, and which greatly prevent its numerical increase. Could they be housed, and headed, and secured at night like our common farm poultry, they would "multiply and replenish the earth;" but it has been found, over and over again, that the young birds which may have been hatched under a hen, although they apparently might assume many of the habits of tameness and domesticity which are characteristic of common poultry, yet, if any one approach them unawares, they fly off to the nearest cover in a state of complete wildness. Mr. Waterton, of Walton Hall, whose studies, in the various species of animal nature, have been extensive, says, "that, notwithstanding the proximity of the pheasant to the nature of the barn-door fowl, still it has that within it which baffles every attempt, on our part, to render its domestication complete. What I allude to is, a most singular innate timidity, which never fails to show itself on the sudden and abrupt appearance of an object. I spent some months in trying to overcome this timorous propensity in the pheasant; but I failed completely in the attempt. The young birds, which had been hatched under a domestic hen, soon became very tame, and would even receive food from the hand when it was cautiously offered to them. They would fly up to the window, and would feed in company with the common poultry; but, if anybody approached them unawares, off they went to the nearest cover with surprising velocity. They remained in it till all was quiet, and then returned with their usual confidence. Two of them lost their lives in the water by the unexpected appearance of a pointer, while the barn-door fowls seemed scarcely to notice the appearance. The rest took finally to the woods at the commencement of the breeding season." For more extended information on this subject, consult Loudon's *Magazine of Natural History;* Mowbray's *Treatise on Breeding and Rearing Domestic Poultry;* and the *Rural Sports* of Mr. Daniel.

Pheasants have, in many instances, been collected in considerable numbers; and under the name of *batteaux*, have served for gala days of sport to the nobility and gentry. These exhibitions were painful, and totally opposed in principle to the real spirit of English sports. We never could comprehend a man's feelings in making a great slaughter of game under such circumstances. *Sport* it certainly is not. To enjoy and obtain this, there must be a given portion of uncertainty and trouble connected with its prosecution. If a man could kill all the game of an extensive and well-stocked preserve in an hour, there would be no *sport* in the case, in the true sense of the word. It would be one of the dullest and most uninteresting acts of his life; but where he has to seek, and to find, and to ramble for miles through a thickly-wooded or moorish country, there is pleasurable excitement produced; and this is the sustaining principle of pure sport, and the true source of all the enjoyments which the pursuit of wild animals can confer on man. It is to wander about; a constant prey to the alternations of hope and fear; the disappointments met with on the eve of realised advantages, that constitute the current of exhilarating feeling and lively sentiment, which we connect with the healthy and natural indulgence in field sports generally. It is a bad spirit for a real sportsman to cherish, to be always craving for great success, and to be perpetually out of humour both with himself and every one about him, if he does not get his bag sooner and better filled than his neighbours and competitors. There is an exclusive and selfish bitterness lying at the root of all such trains of thought, and the habits they engender; and the best receipt for eradicating this pernicious principle is, to look lightly and carelessly on the sport, and to make it a *means*, and not an *end*.

Indeed, we know from experience, as well as from what is daily passing around us, that it is impossible to keep large collections of pheasants from depredations. The slightest noise disturbs them in the night-time, and induces them to crow; and this discovers the places in which they are congregated, when they become the easy prey of the poacher. "When once they are frightened from their roost," observes Mr. Waterton, "they never perch again during the remainder of the night, but take refuge among the grass, and underneath the hedges, where they fall an easy prey to the fox, the cat, and the stoat. A poacher armed with a gun, finds a cloudy night fully as good for slaughter as one on which the moon shines;

and if larch trees grow in the wood, to these he resorts, knowing, by experience, that the pheasant prefers this kind of tree to any other." And then—

—"What avails his glossy, varying dyes,
His purpl'd crest, and scarlet circl'd eyes,
The vivid green his shining plumes unfold,
His painted wings, and breast that flames with gold!"

Pheasants are subject to considerable changes; one of which is, that in certain cases, and in certain years, the female bird assumes the appearance of the male. This curious fact induced Dr. John Hunter to make a series of experiments, with a view of ascertaining whether there was in reality any transfer of gender accompanied by this change of plumage and outward appearance. But he found no organic change whatever in the generative organs. The diseases to which the pheasant is subject are but little understood. It is said that they die off suddenly about the time they are being denuded of their crest and tail feathers, without any apparent illness, having an abundance of food, of which ants and their eggs form a part. Good air, exercise, and even choice grass plots, will not arrest the ravages of the complaint. It has been recommended, by way of cure, that, as in Asiatic countries, of which the bird is a native, it lives very much on aromatic plants, all remedial measures should take this circumstance into consideration. Spices and stimulants are recommended, with nutritious diet, chopped eggs, and shred beef. Pepper pods, and other aromatics, are likewise used, in small quantities. In spite, however, of all care, great mortality sometimes prevails among the pheasants of particular localities.

PHEASANT SHOOTING.

On the 1st of October—which is an interesting day to aristocratic sportsmen, with their well-trained dogs—pheasant shooting begins; and there are a variety of opinions among sportsmen as to the ease with which this species of bird may be shot; some averring that it is difficult to bring it down; whilst others hold that there is no difficulty whatever. Much, however, depends upon the temperament or nervous system of the shooter, his experience, and his practice.

The noise which a pheasant makes when it takes wing—the whirr with which it rushes through the leaves, sends a momentary thrill through the frame of some men, quite sufficient to shake their steadiness of aim, and send their shot *nowhere*, after it has been ejected from the muzzle of the gun. Steadiness is the great matter in exploits of this kind; it determines the relative portion of skill which a man throws into such pursuits.

The spaniel is much recommended for pheasant shooting; and Mr. Daniel considered any other kind of dog out of place when this sort of game was the object of pursuit. "Spaniels," says this authority, "for pheasant or cock shooting cannot be too strong, too short upon the legs, or have too much courage; the thickness of the coverts will oppose, and, sometimes, almost overpower even this combination of form and spirit. * * * Should the woods be very extensive when spaniels are steady from hares, they cannot well be too numerous; but if given to hunt hares, they disturb the pheasants. Upon no account accept or keep a spaniel—it is needless to tell a sportsman not to *breed* from such—which has any taint of the hound in his pedigree, although for generations back; they will be sure to hunt hare in preference to winged game; and the stock may be crossed everlastingly, may attain beauty, strength, symmetry, yet this latent spark of the harrier will never be extinguished." Some shooters use beagles in pheasant shooting with good effect; and even terriers are employed in some districts. But much depends on locality. In thick hedge-rows, young woods, furze plantations, and entangled underwood of any kind, such dogs as the beagle and terrier may be better suited for pheasant sporting than the spaniel; but where the grounds are comparatively open, the latter are to be preferred.

For pheasant shooting the sportsman should be early in the field, and he should scour the stubbles of wheat, barley, and bean fields well. In very bright days, the woods should be carefully explored, for the birds often betake themselves to them in such weather. Cover beating is very essential, and the grounds should be thoroughly tried both with the dogs and the beaters. A nye of pheasants are often found huddled together within a very small

compass. Every section and crevice of a cover should be run over, as birds are frequently found when the sportsman is not expecting them. We have already remarked, that no sportsman will kill a hen pheasant if he can help it. As she is the rearer of the stock, she ought to be most carefully preserved.

"But when the *hen*, to thy discerning view,
Her sable pinions spreads, of duskier hue,
The attendant keeper's prudent warning hear,
And spare the offspring of the future year;
Else should the fine, which custom laid of old,
Avenge her slaughter by the forfeit, gold."

The veteran Daniel is very particular in reference to the proper training of the dogs to pheasant shooting, as they are very apt to disturb the game, if not completely reduced and brought to a knowledge of their duties. "They disturb the pheasants," he says, "who first fly up, and perch upon the lower boughs; and the ground of the covert is in vain traversed, and beat for birds that are already some yards above it; in short, a spaniel that follows a hare further than whilst in view, is never worth keeping. Other circumstances to be minded are, that when a spaniel is once put into covert, he is never to quit it to range in the fields, which some slippery ones will do, whilst their owners are beating within it. When a spaniel owns a haunt, and quests freely, there should be no disappointment; whenever the notes are doubled, their master should be certain there is game, and accordingly press forward. Much depends upon the practice which spaniels have; the constant use, and the killing of game to them, are as essential to the steadiness of a high-mettled spaniel as to a high-bred fox-hound: neither can be worked too hard, if kept well in blood." The writer then goes on to state, that one of the chief conditions of obtaining this desirable end is, that the dogs be of pure breed. There must be no crossing, no contamination of the hound in their blood, as we have already observed, or they will be ill-adapted for the duties they are expected to perform. As an instance of an evil of this kind, he gives the following:—"A stronger instance," says he, "could not well be exhibited than in the spaniels which belonged to Lord Waltham and Mr. Hoare. A road only parted the seats of these two gentlemen, and their gamekeepers frequently shot in the woods together; their dogs were equally handsome; but those of the former would drive hares the whole day through, and consequently sprung everything that accidentally lay in their course; whilst those of the latter no more ran hares than they did sheep; they would indeed find hares, but follow no further than they saw them. They were always in their places, twisting round every stub with that agility, and possessed of such fineness of nose, that neither woodcock nor pheasant could escape their search. Lord Waltham's spaniel bitches had originally a cross of the beagle; and although this was tried to be remedied by resorting to the best dogs, the tendency to *hare* could never be subdued."

A similar case occurred in the north of England, among the dogs of the late Ralph Lambton, Esq. He had some favourite spaniel bitches that had originally a cross with a bloodhound; and this corruption was continually manifesting itself in the conduct of his shooting dogs, whenever sheep or domestic animals of any kind thwarted their movements. That old and excellent sportsman used jocularly to observe, that they would retain their taint, as mankind are doomed to bear the weight of their original transgression, till the end of their existence.

Whether it be the particular nature of the ground on which pheasants locate themselves, or whether there be anything peculiar in their scent, we cannot determine; but, even the best dogs are often in fault whilst engaged in pheasant shooting. Without attempting anything like a solution of this singularity, we give the fact for the benefit of the reader.

The season of the year has a great influence upon the success of pheasant shooting, and there is a considerable difference between the character of October and January birds. At the fall of the leaf the birds are scarcer, and a vast deal more cunning, taking the alarm at the slightest noise made, by the approach of the sportsman. In the opinion of many experienced pheasant shooters, December ought to close the season; for it is contended that, if prolonged later, the birds will fly off and mate with other birds, and will not be likely to remain, if the noise made by the reports of the gun be long continued in every direction around them.

We have already alluded to *battue shooting*, which was formerly common in all parts of Europe, as well as in Great Britain; and must again characterise it as a murderous proceeding, which fills us with horror, rather than admiration, on account of the indiscriminate slaughter perpetrated upon the game races on such occasions. In most books on shooting, relative to the most distinguished of these gatherings among the nobility and gentry, they are minutely detailed; but they are of little or no interest now to the real sportsman.

In Sweden there is something of the *battue* shooting prevalent; but it differs, in some essential particulars, from what was, and, in some instances, still is, followed in France and Germany. Indeed, all over the continent there are innumerable traces of this kind of sporting with the gun; but not of the kind which can add much to a true sportsman's knowledge, or his love for his favourite amusement. In every kind of sports, there should, at least, be some portion of reason and sentiment thrown into them, or they will soon excite disgust, rather than pleasure, in the breasts of all who have any pretensions to humanity, or are even a little removed above the brutal biped, who is guided in his pleasures neither by the laws of reason nor the sentiments of humanity.

In India, even, they have their *batteaux;* and as long as these are confined to the destruction of such animals as are destructive to man, they are excusable, and may, by many, be considered even laudable. Mr. Johnson, in his *Indian Field Sports*, gives us a description of the manner in which one of these celebrations is conducted. "The day before the hunt, or driving commenced, several hundred people were sent to the farthest extremity of the reserved cover, where they fixed on a proper place, and set the nets, which extended about a mile, not in continuation, but at intervals. They required four or five elephants, and twenty or thirty bullocks to carry them. Each net was about forty feet long, and seven feet high; the cords being of the size of a man's little finger, lightly twisted, with meshes about eight inches square, made without any knot whatever, simply by twisting the cords into one another, by which they were rendered more elastic, less visible to the animal, and not so cumbersome and heavy as if made with knots. Sometimes three or four knots were placed in succession, touching, or overlapping one another; but more frequently they were intercepted by jungle, which was made almost impenetrable, by stakes driven down in the midst of it, and thorns twisted between them."

Such are the preparations for an Indian *battue*, which is attended by men, women, and children, all armed with some kind of instrument, either of offence or terror. The children and the women, no doubt, carry the instruments of terror, which are such as will make the loudest noise, in order to frighten the horned beasts from the jungle into the nets laid to entrap them. The slaughter, on these occasions, is sometimes immense; but, as it is generally perpetrated upon the most ferocious and dangerous animals, it excites emotions of a very different kind from those that arise in witnessing the ignoble slaughter of beautiful and unoffending birds. In the destruction of the former, the inhabitants of a village or town, secure with greater certainty the safety of themselves and their property. In the destruction of the latter, it deprives the forest of one of the most beautiful of the ornithological species, and retrenches the pleasures of the naturalist, as well as those of the true and considerate sportsman.

CHAPTER VII.

THE QUAIL.

THE QUAIL (*Tetrao Coturnix*, Linn.) is described as being fully seven inches long. The bill is dusky; the irides hazel, and, in old males, yellow; the crown of the head is black, transversely marked with rufous brown; and down the middle is a yellowish-white line. Above the eye, in a backward direction, is another line of the same colour; and on the chin and throat is a black mark, which has a turn upwards towards the ears. The remaining parts are white, and the hind portion of the neck is black. The scapulars and tail-coverts are of a rufous-brown tint, and the middle of each feather is streaked with yellowish white, surrounded more or less with black. The sides are of the same colour, but not having quite so much of the white streaks. The breast is light ferruginous brown; shafts white; belly paler. The wing-coverts are pale rufous brown, streaked like the back, but more minutely distributed. The quills are dusky; the outer webs more or less mottled with yellowish white. The tail is dusky, tipped with white, and consists of twelve short feathers hidden by the coverts. The hen bird is distinguished by having little or no black on the chin or throat, and by a dusky mark passing from the ears downwards. Some black spots are likewise seen on the chest, and the coverts of the wings are barred with yellowish-white streaks.

The quail is very widely distributed, being known almost throughout the world, with the exception, it is said, of America, where it has not hitherto been discovered. In the countries of the European continent it is very numerous; much more so than in England, Wales, and Scotland. It is often met with in Ireland in large numbers.

This bird has been called the dwarf partridge, from its great resemblance in figure, colour, and habits, to the true bird of that name. "These birds," says Mr. Daniel, "resemble each other by being both pulverulent, having short wings and tail, and running very swiftly; they feed, copulate, build their nests, and raise their young nearly in the same way. Both are salacious, inordinately lustful, and the males quarrelsome; but numerous as are the points of resemblance, they are more than balanced by a number of disparities, which render quails a distinct species; for, omitting the peculiar incident of their migration, quails are universally smaller; they have not the bare space between the eyes, nor the figure of the horse-shoe impressed on the breast of the males, as in the partridge; the quail's eggs are smaller, and of an entirely different colour; their notes are unlike: the flesh of the quail is also of a different flavour, and more loaded with fat; the period of their life is shorter, for the quail does not live more than five years. They are less cunning than the partridge, and much more easily ensnared, especially when young; their dispositions are not so gentle, and it is extremely rare to see them tamed. Quails seldom form themselves into coveys, except when their wants unite the feeble family to their mother, or some powerful cause urges, at once, the whole species to assemble and traverse together the extent of the ocean, holding their course to the same distant land: but this forced association does not subsist after they have alighted, and find in their adopted country that they can live at will. The appetite of love is the only tie, and even this is momentary: so soon as passion has spent its force, the male abandons his mate to the labour of raising the family. The young quails are hardly full-grown when they separate; or, if kept together, they fight obstinately; and their quarrels are terminated only by their mutual destruction."

The quail is migratory in its habits; and though many attempts have been made to naturalise it in this country, the instinctive desire to migrate, has hitherto frustrated all such attempts. This bird has engaged the attention of the naturalist and the sportsman from the earliest times. Pliny says—"Quails alight in such numbers on ships (and which is

always in the night), by their settling on the masts, sails, &c., as to bear down barks and small vessels, and finally sink them; and, on that account, the sailors have a great dread of them, when they approach near to land." In the autumn, large flocks of them cross the Mediterranean from Italy to Africa, taking in their route, both in departing and returning, the various islands of the Archipelago as their resting-places. They are often in such prodigious numbers as absolutely to cover the entire face of the country. In Alexandria they are so common, that they can be readily bought for a farthing each Many of the crews of merchant vessels have been so much confined to feeding on its flesh, that it has been the cause of certain diseases breaking out among them, and complaints have formerly been made on the subject to the British consul at Alexandria. These birds assemble in autumn on the northern shores, to emigrate southward; and it has often been remarked, that they delay their departure until the north wind rises, when, towards sunset, the entire body take wing, and display such swiftness as to traverse one hundred and fifty miles by break of day. In Italy, Sicily, and most of the Greek islands, they arrive at a stated season in immense numbers, and with singular punctuality, not differing, in the average of years, above a day or two at the utmost. One hundred thousand have been known to be taken in a day. They are run after during the night, and great numbers perish in the chase In Sicily, there is quite a sensation produced when they arrive. Crowds, of all ages and ranks of life, are assembled to witness the sight. The number of boats is likewise astonishing; and their passengers all carry guns and pistols, to have a shot at the feathered strangers. Ortygia was named from them; and so abundant were they on the island of Capri, at the entrance of the Gulf of Naples, that they constituted the chief source of revenue of the bishops of the place. There were a hundred and sixty thousand captured in one season. In China, and in many of the islands in the Eastern Archipelago, they are also extremely plentiful.

With respect to these birds having an instinctive knowledge of the precise time for emigration, we have a very singular fact in some young quails, which, having been bred in cages from the earliest period of their lives, had never enjoyed, and, therefore, could not feel, the loss of liberty. For four successive years they were observed to be restless, and to flutter with unusual agitations regularly in September and April; and this uneasiness lasted thirty days at each time. It constantly began about an hour before sunset. The birds passed the whole night in these fruitless struggles, and always, on the following day, appeared dejected and stupid.

It is observed in the *Rural Sports*, that they are birds of passage, some entirely quitting our island; others shifting their quarters, as it is said, from the neighbouring inland counties, into the hundreds of Essex, in October, where they continue all the winter. If frost or snow drive them out of the stubble-fields and marshes, they retreat to the sea-side, shelter themselves among the weeds, and live upon what they can pick up from the *algæ*, &c., between high and low water-mark. Their appearance in Essex coincides with that of their leaving the inland counties; and this same observation has been made in Hampshire. The quail, like the partridge, makes no nest, except a few dry leaves or stalks scraped together may be so called; and sometimes a mere hollow in the bare ground suffices: in this the female lays six or seven eggs, of a whitish colour, marked with irregular rust-coloured spots. Mr. Holland, of Conway, once found a nest with twelve eggs, eleven of which were hatched; and Mr. Daniel saw a bevy of nine young ones.

In combative qualities the quail holds distinguished eminence. He fights long, and dies hard. The Greeks and Romans cultivated the pugnacity of this bird to a great extent; and the conqueror in a regular pitched battle was highly prized. Indeed, in such estimation was he held, that Augustus put a prefect of Egypt to death for having brought a conqueror to the table to be eaten—a singular act of imperial justice, that estimated the life of a man as of no more value than that of a bird. During the middle ages, quail-fighting was common; and Henry III., king of Castile, devoted much of his time to the catching of quails for the purpose of matching them in fights. His subjects usually hunted them morning and

evening, and had regular combats with them at places adapted for the purpose. Scaliger informs us, that the Italians have costly gardens purposely laid out to hunt them, by means of quail-pipes, with which they pursue the birds as a great amusement.

In some countries the quail is said to be more prolific than in others. In Italy and France, from fifteen to twenty is a common produce; but, in hotter climates, twenty-five and thirty are sometimes found in one nest. This large number of eggs accounts, in some degree, for the numbers of the birds. Some sportsmen maintain that they hatch twice a year; but this does not appear to be satisfactorily proved. This subject is touched upon in a communication inserted in the *New Sporting Magazine*, vol. v.; wherein it is said—"This place (the Isle of Thanet) was formerly so famous for them (quails), either from its vicinity to the French shore, or the quantity of grain which is cultivated, that people come from great distances for the express purpose of quail shooting; of late years, however, their numbers have considerably decreased; but still the sportsmen, in the beginning of September, may commonly kill from two to three brace a day. Along the banks of the Thames, below Purfleet, several farmers and sportsmen have assured us, that, about the beginning of November, a time at which the departure of the main body has taken place, a small number of quails make their appearance, and continue during the winter, always at a short distance from the river's edge; these are evidently the young birds of the second bevy, who, for some reason, seek that particular situation after the migration of the rest of their species."

Respecting the abundance of these birds in the East, we find it related in a work, entitled *Letters from the Campagne Felice*, that, during the time when the Capitani Bey blockaded the harbour of Alexandria, one of his Greek seamen caught two or three that had perched on the rigging of the ship. They were presented to the capitani; and he was so pleased with them, that he offered a piastre for every one that should be brought him. The price was a great temptation; and, in a few days, the sailors found means to cover the rigging with flocks of quails. Every one caught, was, as a matter of course, brought to the capitani, who, to escape impending ruin, was forced to stand out to sea, or break the promise he had made to the captors of the birds. He preferred the former alternative.

Quail shooting is, in this country, principally confined to the counties of Essex, Kent, Cambridge, Suffolk, and Norfolk; and the bevies seldom exceed ten in number, and are generally under that figure. They are to be found in the evenings, feeding in corn-fields; and sometimes they lie remarkably still, and may be readily approached. At other times, however, they are as wild as possible. A steady dog is indispensable; but it must be remarked, by way of caution, that most dogs are apt to be spoiled for some time after they have been employed in tracing these birds. Common partridge shot is recommended; but some quail shooters prefer No. 7.

These birds usually sleep during the day, concealed in the tallest grass, lying on their sides, with their legs extended, in the same spot, even for hours together. So very indolent are they, that a dog will sometimes absolutely run upon them before they are flushed; and when they are forced to take wing, they seldom fly far. They are easily drawn within reach of a net, by a call imitating their cry, which is not unlike the words *whit, whit, whit:* this is done with an instrument called a quail-pipe.

Great numbers of these birds are imported from France, for the table; all of which are males. They are conveyed in large square boxes, divided into five or six compartments, one above another, just high enough to admit of their standing upright. Each of these boxes contains about a hundred. Were the birds allowed a greater height, they would soon kill themselves; and, even with this precaution, the feathers on the top af the head are generally beaten off. These boxes have wire on the fore part, and each partition is furnished with a small trough for food. Quails may be forwarded in this manner, without difficulty, to great distances.

CHAPTER VIII

THE WOODCOCK.

Woodcock shooting has been called the "Fox-hunting of shooting"—a phrase at once descriptive of its character and dignity.

The *Woodcock* (*Scolopax Rusticola*, Linn.) is placed by naturalists at the head of the *snipe* genus. It is thus described by Bewick and others:—"Its length is about fourteen inches; twenty-six in breadth; and its weight about twelve ounces, though sometimes it is found to the extent of fourteen. The shape of the head is considered somewhat curious, being more obtusely triangular than round; and the eyes are placed very forward, near the top of the ears, and nearly in a line with the corners of the mouth. The upper mandible, which measures about three inches, is furrowed nearly its entire length; and at the tip it projects beyond, and hangs over the under one, ending in a kind of knob, which, resembling those of others of the same genus, is susceptible of the finest feeling, and calculated by that means for aiding, perhaps, by an acute sense of smell, to find the small worms in the soft and moist grounds, from whence it extracts them with its sharp-pointed tongue. By means of its bill, it likewise turns over and tosses about the fallen leaves, in search of insects which take shelter underneath. By the entire conformation of the bird, and particularly for the structure of its head, we have an opportunity of displaying some of the wonderful contrivances which Nature has instituted for the sustenance and preservation of her various orders of animated beings. From the extreme sensibility of the mouth of the woodcock, some structural peculiarities are required to gain a given end or object—the capture of insects deeply embedded in either mud, earth, or decayed wood."

The woodcock, it has been said, is naturally of a shy and retiring disposition, rarely taking wing by day, unless disturbed; but just as twilight begins, it quits the woods, and, nearly at the same instant, wanders over the meadows in search of wet and splashy places, and moist grounds, in quest of food. As the day dawns it retires to its hiding-place. Thus, when most other birds are recruiting exhausted nature by sleep, the woodcock is roaming through the dark, directed by an exquisite sense of feeling, which it experiences by means of its long and singularly-constructed bill. The eye is not called into use; and, like the mole, it may be said to feed beneath the surface; and by the sensibility of the instrument, which is thrust into the soft earth, not a worm, however small, can escape that is within its reach.

The eyes of the woodcock are of large dimensions in proportion to its general bulk of body; and, like those of some other nocturnal birds, have the capacity of collecting the faint rays of light, in the darkened vales and sequestered woodlands, during its nocturnal excursions. Thus, likewise, it is enabled to avoid coming in contact with trees and other obstacles, which are continually offering impediment to its flight. The nerves on the bills, like those of the duck tribe, are very numerous, and have a highly sensible power in discriminating between objects by the sense of touch. A woodcock, in a menagerie, has discovered and drawn forth every worm in the ground, which was dug up to enable it to bore with its bill; and worms put into a large garden-pot, covered with earth, five or six inches deep, wholly disappear before the ferocity of the woodcock by the next morning. The enormous quantity of worms which woodcocks devour is scarcely credible; indeed, it would be the constant labour of one person to collect such food in sufficient quantity for two or three of these birds. The difficulty of collecting a sufficiency of such precarious aliments, has led the interested to try if bread and milk would not be a good substitute; and it has been found that, by placing clean-washed worms into the mess, the bird soon acquires the taste for its new food, and would eventually eat a basin of bread and milk in twenty-four hours, besides the worms it could obtain.

The digestive powers of the woodcock are remarkably vigorous, and work with great rapidity. On anatomical examination there is very little found in its stomach and intestines, save a few fibres of a vegetable texture, mixed with some sand, small stones, and gravel.

Of the British species of woodcock there are three varieties. "In the first," says Dr. Latham, "the head is of a pale red, body white, and the wings brown; the second is of a dun, or rather cream colour; and the third of a pure white. Dr. Hesham, in his *Catalogue of Cumberland Animals*, mentions having met with one, the general colour of which was a fine pale ash, with frequent bars of a very delicate rufous; tail brown, tipped with white; and the bill and legs a flesh colour." In addition to these, some other varieties are taken notice of by Marmaduke Tunstall, Esq., of Wycliff, in his interleaved books of Ornithology. Mr. Daniel seems likewise to be aware of such a difference; for he observes that there are different sizes of woodcocks. Those found in the first part of the season are of the largest size, fly heavily, and their heads appear to be muffled, especially the under parts, with short feathers. The most numerous tribe, which arrive in November and December, are rather smaller, their heads less, the feathers smoother, and the bills shorter. Woodcocks that arrive in this country about Candlemas, are likewise small, and differ in their manner of flying; are quicker of wing, take pretty long flights, and are well known to be very difficult to shoot, on account of their not rising above the spray, like the larger muffled woodcocks, but make their way for some distance, as it were, among the boughs. Mr. Baillon also notices two kinds of woodcocks. "The largest arrive first, and may be distinguished from the others by the colour of their legs, which are of a greyish tint, inclining to rose colour. The smaller kind have a coating similar to that of the common woodcock, but their legs are blue. Variegated plumage, and other anomalies, now and then occur among these birds: thus, a pure white one has been seen; and we can only wonder that still greater variations do not frequently take place; for although most sporting works, in their account of the woodcock, usually confine his foreign residence to the north of Europe, yet it should be known that he is likewise found in all the climates, both hot and cold, in the old continent, as well as in North and South America. It is, however, a curious fact, that he is everywhere an emigrating bird. His migrations in some countries appear, however, to be confined to a journey from the plains to the mountains, and *vice versâ*. In Europe he is located during the summer on the Alps, Pyrenees, and other lofty mountains, from whence he migrates to the regions below, and probably some reach us. His universality thus established, we need not be surprised that he should thus *sport* into varieties, seeing that every locality, according to its proximity or remoteness from what may be considered as his attracting spot for domestication for the time, has its influence over the size, colour, and even the aptitudes of the bird."

The *sex* of the woodcock has been considered as entirely unmarked by any external signs; but internally it can be readily detected. Mr. Pennant thinks, from the examination of the bird's feathers, which in the *hen* present a narrow stripe of white along the lower part of the exterior veil of the feather, would be sufficient to do away with all doubt upon the question as to which is the cock and which is the hen. In the male bird, the same feather, at the same part, is beautifully and regularly spotted with black and reddish white. Many sportsmen maintain that there is another criterion—namely, the greater size of the female bird; but this is not invariably to be depended on.

The female woodcock makes a very careless nest, consisting of some dried leaves and fibres, on the bare ground, and very often chooses the root or stump of a decayed tree for the locality. She commonly lays four or five eggs, a shade larger than those of pigeons, and of a rusty green colour, blotched and marked with dusky ill-defined spots. The young quit the nest as soon as they are freed from the shell; but the parent bird continues to attend them until they can provide for themselves. Buffon informs us that the mother will sometimes take a weak bird under its throat, and carry it more than a thousand paces.

The flesh of this bird is, by gastronomes, held in high estimation; and it is eagerly sought after by many sportsmen. In cooking

it, the entrails are not drawn, but roasted within the bird, whence they drop out with the gravy, upon slices of toasted bread, and are relished as a delicious kind of sauce. The Italians and French have each particular modes of preparing this bird for the table, which they do in such excellent style as to leave an impression on the palate of the eater for some time after.

The woodcock is migratory in its habits, and generally arrives in the south of England during the month of October. It does not come in large flocks, but in ones or twos, till about the month of December. They are, very probably, much influenced in their movements by the wind, which, if it blow from a continental quarter, is more likely to aid their flight than when it comes from the opposite direction. The birds have a singular instinct of landing only in the night, or in dark misty weather; for they are never seen to arrive by day, but are frequently found next morning in any ditch which could afford them shelter, particularly after the great fatigue they must have undergone in buffeting the adverse winds which they must frequently have to encounter in their aërial voyages. They do not remain on the shores to take their rest longer than a day, but proceed inland to the very same haunts which they occupied during the preceding season. In stormy weather they retire to the moors and mountains; but as soon as the frost sets in, and the snow begins to fall, they return to lower and more congenial situations, where they meet with boggy grounds and springs, and little oozing moss-fringed rills which are rarely frozen, and seek the shelter of the close bushes of holly, furze, and brakes in the glens, or dells which are covered with underwood. There they remain concealed during the day, and remove to different haunts, and feed only in the night. From the beginning to the end of March, or sometimes to the middle of April, they gradually approach the coasts, and avail themselves of the first fair wind to return to their native woods. Should the weather be unfavourable to their migrating, they will delay their departure, when their numbers increase by degrees, and when they are more easily found and destroyed by their numerous enemies.

Other accounts say that they leave the north with the first frost, and travel slowly southwards till they come to their accustomed winter quarters. They do not usually make a quick voyage, but fly from wood to wood, reposing and feeding on their journey; selecting such woody haunts as are in the vicinity of moist and marshy springs. They conceal themselves under thick bushes by day, and fly abroad to feed in the dusk of the evening. A laurel or holly-bush forms a favourite place for their repose. The thick and glossy leaves of these trees prevent the radiation of heat from the soil, and they are less affected by the refrigerating influence of a clear sky, so that they afford a warm and comfortable retreat for the woodcock. These birds usually take to the north on the first approach of spring, and their flights are generally longer, and their rests fewer at this season than in autumn. In the latter they are driven from the north to the south by the want of food, and they stop wherever they can find it. In the spring there is the influence of another powerful instinct added to this—the sexual feeling. They migrate in pairs, and pass as speedily as possible to the place where they are likely to find food, and where they can rear their young with the probability of being unmolested, of which the old birds have already had the experience of former years. Scarcely any woodcocks winter in any part of Germany. In France there are a few found, particularly in the southern departments; and in Normandy and Brittany. The woods of England, especially of the west and south, contain always a certain number of these birds; but there are far more in the moist soil and warmer climate of Ireland. In the woods of southern Italy and Greece, near marshes, they are still more abundant; and they are generally diffused over the Greek islands, Asia Minor, and Northern Africa.

Woodcocks have been known to settle upon a vessel at sea. Mr. Travers, of Cornwall, records an instance of this, when at such a distance from land as to make it rare for birds to be seen. When first discerned, it was high in the air, hovering above the ship, but gradually descended; and, after making several circuits round the vessel, at length alighted on the deck. Its exhaustion was so great, that it allowed itself to be taken up by the hand.

In their flight, woodcocks, like other birds,

are attracted by a glare of light; and many instances have occurred, at the Cromer and Eddystone lighthouses, of their falling victims when dashing against the windows of these structures. At the lighthouse upon the Hill of Howth, the man who attended it on one occasion, was surprised by a violent stroke against the windows, which broke a pane of plate-glass, more than three-eighths of an inch thick. On examining the balcony which surrounds the light, he found a woodcock, which had flown against the window with such violence as to break his bill, head, breast-bone, and both wings. The man had often found birds which had killed themselves by flying against the glass, but had never before known of a pane to be injured.

Woodcocks have been seen at their first arrival, in considerable numbers, on the coast of Sussex, in the church-yard, and even in the streets of Rye; but during the night, the usual time of their flying, they have betaken themselves to less dangerous and more natural quarters. At their first visit for the season to the coast, they are commonly poor in condition, weakened and wasted through great exertion, and, likewise, sometimes scurfy, though not so much so as before their return in the spring. The taste of the flesh has also become quite metamorphosed. On their arrival, this is usually marked by insipidity of flavour; but when they have been a short time feeding in the country, it greatly improves, both in point of richness and delicacy. If a woodcock is shot just before its departure, it bleeds plentifully; whereas, at the beginning of winter, it yields hardly any blood at all. From this circumstance it would seem, that in those countries where they have their summer residence, they live on a different kind of food to what they find here. Probably the luxuriant and succulent aliment which they meet with among us, prepares them for breeding in those countries to which they retire with the companions of their choice.

The time when the woodcock appears and disappears in Sweden, agrees exactly with the periods of their arrival in, and departure from, our own island. Their autumnal and vernal appearance on the coast of Suffolk have been accurately noticed. They come over sparingly in the first week of October, the greater numbers not arriving till November and December, and always after sunset. It is the wind, and not the moon, which determines the time of their arrival; and it is probable that this should be the case, as they come hither in quest of food, which fails them in the places they leave. If the wind has been favourable for their flight, and if they remain at all on the coast where they alight, it is but for a very short time; but if they have been forced to struggle with an adverse gale, they rest a day or two to recover their strength. In such cases they have been known to be so much exhausted, that they have been taken up in Southwold streets, nearly dead. They do not come in flocks, but separately, and disperse like so many feathered skirmishers making their way through the fields of air.

France, Germany, and Italy are treated in the same manner as we are, when the proper season arrives. They visit Burgundy in the latter end of October, but continue there only four or five weeks; it being a dry country, they are forced from it, for want of sustenance, by the first frost. In the winter they are found in great abundance as far south as Smyrna and Aleppo. During the same season they appear in vast quantities in Barbary, where the Africans call them the "ass of the partridge." It has been asserted that some have been seen as far south as Egypt, which is the remotest migration to which they can be traced on that part of the African coast of the Mediterranean; on the other side of Asia they are common in Japan. The woodcocks that resort to the countries of the Levant, probably come from the deserts of Siberia, or Tartary, or the old mountains of Armenia. In the neighbourhood of Athens, woodcocks abound, descending, after snow on the mountains, into the plains, and suddenly retiring if the weather continues severe. They enter the gardens of the town in great distress, rather than cross the sea, and are sometimes caught with the hand.

It is now fully ascertained that they occasionally breed in this country, and even as far north as the Orkney Islands; but it is maintained that these birds are not nearly so plentiful as they were half a century ago, amongst us. Perhaps this may really be the case; but the fact has been doubted. It is the common failing of some minds to exaggerate the

past at the expense of the present. It is therefore safe to be somewhat incredulous in this matter, in order not to attach so much credit to these statements as some writers do. There is a greater number of sportsmen now than formerly, at least in the shooting art; and this may account for fewer woodcocks being killed by any single person. The sport, we believe, is more generally diffused, but not seriously, if at all, diminished from former times.

In regard to the kind of dogs which should be used by the woodcock shooter, spaniels are the best. Pointers and setters are taken by some; but they are considered inferior to the spaniel where the woods are extensive and thickly set with underwood, brambles, and thorns. The spaniel should, however, be well trained, and should be taught both to hunt close or wide, as circumstances require. Both beaters and markers are requisite in extensive woods. The employment of beating and marking necessitates a regularly digested plan of operations, and a minute regard to instructions previously agreed upon among the parties. Those engaged in it must take their stations at a given spot, and pay attention to each other's signs and movements, otherwise they will be working at cross purposes, and prove worse than useless. Many beaters take sticks to beat the bushes and underwood; while the markers take up their position on some elevated piece of ground, or even some tree, that they may the better see the birds, and mark accurately where they drop, in order to be able to give correct instructions to the sportsman.

Large numbers of woodcocks are taken by means of nets and traps, and find their way to the London markets, where they generally bring tolerably high prices. It is said that, in the neighbourhood of Torrington, in Devonshire, these birds are so numerous throughout the season, that they have been killed to the value of nearly two thousand pounds in one year. Catching them by nets and springes is common in the hilly counties of Cumberland, Westmoreland, and Durham. The same practices are in operation in Wales to a great extent. Mr. Dobson, in his *Kunopœdia*, says—"The poacher's dog in Wales is an ugly, raw-boned, cross-made derivation from the light setter, degraded through half-a-dozen generations of bastardy, with a view of being made into pointers. Than this, it is not possible to conceive more unpromising materials; and if such be the effects producible upon this stock, it is fair to conclude what a similar discipline is capable of doing with superior natures. By hunger and hard work, of both of which they have plenty, they are brought down to obedience; and their draw upon a cock in a wood, under the dread of their master's arm, with the power of which they soon become acquainted, is wrought into a full stop."

Formerly there was a regular system of shooting and entrapping woodcocks pursued in Scotland, for the Edinburgh and Glasgow markets. In some localities of that country the birds are very common, and there is a varied abundance of food for their support, particularly on the western side of the island, where the winter season is comparatively mild and open, and the springs and boggy grounds are not so liable to be frozen. In a letter written by Sir Walter Scott, to a friend, he says—"I have been out for two or three days endeavouring to obtain a shot or two at a woodcock, but I have not been successful; the fact is, these birds are now taken off wholesale by a band of men who do nothing else for the season but kill them, and they find a ready and profitable market for them in all our large and populous Scottish cities and towns. I was lately informed, by one poulterer of Edinburgh, that he had paid one man nearly a hundred pounds last season for woodcocks, which he had chiefly shot in the western parts of Argyleshire and Inverness-shire. This seems prodigious." It is likewise stated, in the work from which this letter is taken (*Annals of Sporting, Edinburgh*), that formal applications had been made to the magistracy of several districts in Scotland, to endeavour to put a stop to this wholesale destruction and traffic.

Ireland is highly praised for its woodcock sporting. Colonel Hawker says, "that a real good sportsman feels more gratified by flushing and killing a woodcock, or even a few snipes, than bags-full of game that have been reared on his own or his neighbour's estate. Localities of cock shooting are widely distributed over the British dominions. Ireland, throughout, is unquestionably the very best spot for a zealot in cock and snipe shooting; the nature

of the ground, inclined as it is to bog and marsh, suits the one and the other of these birds." On the same subject, the Colonel remarks—"If a sportsman is fond of cock shooting, it will repay him well for his trouble to take a trip to Ireland; it is not material what part to recommend, as it is impossible almost to go to a bad place for sport. As to asking leave, it is needless; as the only cause of jealousy that can subsist between the visitor and the owner of the ground, will be, for not acquainting him of his coming, in order that he might have had it in his power to receive him in the usual hospitable manner, by providing beaters to show him sport, giving him the best of fare, a good bottle of claret, a sincere and hearty welcome; assuring his guest, the longer he stays and honours him with his company, the more welcome he is, and the happier he will make him."

CHAPTER IX.

THE SNIPE.

Snipe shooting can be enjoyed in almost all parts of the kingdom; but we do not think that it is a sport calculated to be so attractive to the generality of shooters as the pursuit of the game of the mountains and the moors. To many, however, it affords a sufficiency of excitement; whilst it always secures them as much exercise as will add to their health, and helps to render them cheerful companions whilst sitting at the fireside of their homes.

There are three different kinds of snipes known to the British sportsman.

The *Great Snipe* (*Scolopax Major*, Linn.) is a comparatively rare bird; the upper portion of its plumage nearly resembling that of the common snipe. The breast, sides, belly, and vent, are white, spotted, barred, and undulated with black. Its weight is about eight ounces; and length sixteen inches. The bill is like the shape of the woodcock's, and about four inches long. The crown of the head is black, and divided down the centre by a pale stripe; and over and beneath each eye there is another of the same colour. The upper parts of the body resemble those of the common snipe; the feathers on the neck, breast, and sides, are edged with a dusky white, and those of the belly spotted with the colour. The middle, however, is quite plain. The quills are dusky, and the tail reddish; the two middle feathers of which are plain, and the others barred with black. The legs are black. This bird is not common in England; but is sometimes found in the counties of Lancaster and Kent. Some designate them the *solitary snipe*, from always being found alone. In Germany and Siberia it appears; and Latham tells us that he saw one among a quantity of birds sent from Cayenne. Snipes are seen throughout the Old Continent, from the Arctic regions to the Cape of Good Hope, where they are common. They are also found in the islands of Ceylon and Japan. In America they are almost universally distributed.

The *Common Snipe* (*Scolopax Gallinago*, Linn.), or the *Heather Snipe*, is described as about four ounces in weight, and nearly twelve inches in length. The bill is three inches long, and of a dusky colour; and, in some individual cases, the base is light, flattish, and rough at the ends; the irides dusky. The crown of the head is black, with a longitudinal light rufous line down the middle; and another line passes from the base of the upper mandible, of the same colour, on each side over the eyes. Between the bill and the eye there is a dusky line. The throat is white; and the cheeks, neck, and upper breast are mottled with black and light-coloured patches. The back and scapulars are black, barred with brown, and striped with yellowish buff-coloured longitudinal lines. The quills are

black; the first edged with white, and the secondaries are tipped with the same. Those next to the body are, with their coverts, striated and barred with an iron-grey colour. The lower breast and belly are white; upper tail-coverts brown, barred with black. The tail consists of fourteen black feathers, barred and spotted with dull orange red towards the end, and with a narrow bar of black near the tip, where it is of a pale rufous colour. The legs vary; in some they are dusky, or lead-coloured, and in others black.

The *Jack Snipe* (*Scolopax Gallinula*, Linn.) This species is described, in the *Ornithological Dictionary*, as nearly half the size of the common snipe, and weighs about two ounces. Its length is about two inches and a-half. The bill is nearly two inches long, of a lead colour, black at the point, and the upper mandible of a light colour, and the irides black. The crown of the head is black, and slightly edged with rusty brown, bordered on each side with a yellowish streak, beneath which is a dusky one; and close above the eye is another streak of a light colour. From the bill to the eye is a dusky stroke. The black is varied with ferruginous brown, and dusky. The back, rump, and scapulars are of a fine, glossy, changeable green and purple; the exterior webs of the latter, deep buff colour, forming the two conspicuous lines from the shoulder to the tail. The quills are dusky, and so likewise are the wing-coverts, bordered with brown. The lower breast, and all beneath, is white. The tail is cuneiform, consisting of twelve pointed dusky feathers, dashed more or less with an iron-grey. The legs are of a greenish hue. The jack snipe comes later in the season than the common snipe; and no instances are known of its ever having remained in this country during the breeding season. It is very common in most countries of Europe, as well as in the various states of North America.

We have already said that snipes are found in tolerable abundance in all the old countries of Europe, in Africa, Asia, and the islands of the Eastern Archipelago. In the American continent they are very numerous, especially in the states of North and South Carolina. In Egypt, they frequent the rice-fields or plantations in such swarms, that it is no uncommon circumstance for a man to shoot a basketful in a day. It is said, however, that the sport here is fatiguing, from the light earth of the rice-grounds being so deeply mixed with water, that the shooter sinks, at every step he takes, often above the knees. Snipes arrive in Lower Egypt at the beginning of November, and pass the entire winter there.

"The snipe is hardly ever found
In woods; he's fond of open ground,
The rushy pond, the quiet brook,
But chiefly to the marshes look;
The plashy heath and boggy moor
Yield frequently an ample store;
Stick to them well when this the case is,
They very quickly change their places;
To-day the sportsman can pursue
The numerous game *till all is blue.*
To-morrow he goes out again,
But mayn't a single shot obtain;
Affected by the wind and weather,
They often flock away together;
Sometimes they to the hills repair,
Rising in whisps all wildly there;
Vain the pursuit, but if a gale
Should quickly from the east prevail,
Or even from the boisterous north,
Again you ought to sally forth."

These lines, though scarcely poetical, are valuable, on account of the truthfulness of their directions. They are taken from *Remarks on Shooting*, by Mr. Watt.

The snipe begins to *pipe* in the first week of April. Many breed in this country. Their nests are composed of dried grass and plants, now and then intermixed with feathers. They lay four or five eggs—sometimes six are found—of a dirty olive-colour, marked irregularly with dusky spots. The young have an ill-formed, shapeless appearance. It has been well ascertained that the mother never deserts them until their bills have become long, and of sufficient firmness to enable them to seek and procure food for themselves. When disturbed much in the breeding season, the parents soar very high, and the male bird will keep on the wing for an hour together, mounting like a lark, and uttering a shrill and piping noise. It then descends with great velocity, and makes a bleating sound, resembling that of a goat, which is repeated alternately round the spot which the female occupies, especially if she is then hatching her eggs. This sound, in the days of superstition, was called the *campana cœlestis*.

Snipes of all kinds feed mostly on worms and insects, which abound in moist grounds and marshy localities. Snails have occasionally been found whole or undigested in their stomachs. Their flesh is fat and savoury; and they are cooked in the same manner as woodcocks, without extracting the entrails.

From observations made by a gentleman in Norfolk, and furnished by Mr. Daniel, it appears that the common snipe arrives in the vicinity of Norwich in the early part of September, and stops for a day or two, or perhaps only for a few hours. They often come in large flocks, and lie very light on the ground. At the end of October the greatest numbers make their appearance; but as soon as the cold weather commences, they almost entirely disappear, and return no more until March, previous to their final departure. During the frost, the spring ditches are, when free from ice, carefully examined; but, excepting on two or three early days of frost, very few birds are found. The forwardness or backwardness of spring seems invariably to regulate their movements, which induced this gentleman to remark the coincidence of the time of the flowering of wild plants, and that of the reappearance of the snipes. In February, a few punctually arrived; but on frost setting in, they departed again. The marshes were searched, but not a snipe could be seen. In March they again visited the moist grounds and springs, in considerable numbers, in company with a large flock of lapwings; but in a few days they left for other countries. The next spring being a very early one, many made their appearance in the first week of March. They came in flocks, but in a fortnight they had all gone away. It would appear from this, that the weather has a great deal of influence in determining the movements of the snipe which has a very powerful and an unerring instinct.

SNIPE SHOOTING.

Snipe shooting is considered by Mr. Thornhill to be no bad test of a man's love of genuine sport, if he feel a strong partiality for this kind of shooting. He observes—"Snipe shooting is a sport the best calculated (grousing excepted) to try the keenness of the sportsman, to ascertain his bottom, and if he can stand labour, water, mire, swamps, and bogs. He should be possessed of a strong constitution, not liable to take cold, and have all the fortitude, as well as exertion, of a water-spaniel; he should be habitually inured to wet, dirt, and difficulty, and not be deterred by cold or severe weather." Mr. Daniel says—"Snipe shooting, when the birds are plentiful, is an excellent diversion: they are said to puzzle the marksman by the irregular twistings of their flight when first sprung; but this difficulty is soon surmounted if the birds are suffered to reach to a certain distance, when their flight becomes steady, and easy to traverse with the gun. There is no reason to be apprehensive of their getting out of the range of the shot, as they will fall to the ground if struck but slightly with the smallest grain. Snipes, like woodcocks, and many other wild birds, always fly against the wind; therefore, by keeping the wind at his back, the sportsman has this advantage of the bird when it rises—that it presents a fairer mark. These birds are scarcely good till November, when they get very fat. In hard, frosty, and more particularly in snowy weather, snipes resort in numbers to warm springs, where the rills continue open, and run with a gentle stream; these, on account of their long bills, are then the only places where they can hunt for food. Snipes will generally lie well to a pointer; and some dogs have a singular knack of finding and standing to them."

Regarding the difficulty of shooting snipes, some affirm that it is very great, whilst others affirm quite the contrary. To be cool and collected is a great point gained; for where there is hurry and trepidation, the chances are greatly against the shooter. The motion of the bird is irregular, and is supposed to arise from the nature of its visual organs, being so constructed as to see things in daylight very indistinctly and obscurely; and this is supposed to be the cause of that unsteadiness of flight so embarrassing to the sportsman. It must be remembered, that in snipe, as well as in woodcock shooting, there is what is called a *knack* to be obtained; a rapidity of action, and promptness of aim, which practice, joined to a particular temperament of body and mind, alone secure. It is remarked by Mr. Blaine, that it has been said, "in some writings,

that the snipe is the hardest to hit of all birds; whereas, in others, it is said to be anything but difficult to bring down a snipe. In our opinion, however, there are two methods of hitting him with moderate certainty: the one is by snap-shooting, which is a habit gained by some, but not to be critically described by any, except we regard it as a consentaneous action of eye and hand at the same moment. The other certain mode of snipe shooting is to put the gun into the hand of the cool and deliberate marksman, who, nothing flurried, waits his opportunity, and the moment the bird settles into its course, arrests that course by a shot." The *Oakleigh Code* affirms, that "the shooter will bring down a snipe with much less difficulty at from fifteen to twenty paces, than at any other distance. The aim is thus taken just before the bird begins to make its cross-flights, but before it has attained its full speed. The irregularity of its flight is of little consequence during the first and second twisting, before the bird is safely on the wing, since its flight is then comparatively tardy. But let the snipe fly ten yards from whence it sprang—let it be, for instance, twenty-five paces distant from the gun—it is then at the top of its speed, and in the very midst of its sidelong, elliptical gyrations, and more than a match for the majority of shooters."

Whether dogs should be employed in snipe shooting is another point of dispute; but where there are many men there must be many minds; and if these were to agree in all things, they would soon become rusty and useless. Accordingly, some maintain that dogs are useless in snipe shooting; whilst others consider them as highly necessary. "Who shall decide when doctors disagree?" Mr. Blaine tells us, that he shot snipes in England, Ireland, and Scotland, and never did so without a dog, if he could get one. In Ireland, snipe shooters not only have dogs, but beaters and markers in addition.

We believe that snipes were, in this country, much more abundant than they now are. Mr. Daniel tells us, that snipes, in the Cambridgeshire fens, were, at one period, most abundant; those brought to Cambridge market, which at that time were all shot birds, sold at threepence to fivepence each. One season he killed, in three mornings, thirty-three couple of snipes; and from having known his father's men catch them by drawing with a net in the night-time, he mentioned to a person near Milton Fen, his surprise that this mode of taking them had not been resorted to. The fenman inquired what sort of net was to be used, and was told a lark-net would answer the purpose of a trial. This the fenman soon borrowed, and, the first night of his making the experiment, caught as many snipes as a small hamper could contain. The practice soon became general; and the netted were so much better than the shot birds, that the latter could scarcely find a purchaser in the market. The price at Cambridge afterwards increased to a shilling, and sometimes to eighteen-pence a-piece. The Duke of Marlborough's gamekeeper, on one occasion, killed twenty-two snipes at one shot.

A French sporting writer says, that, in the year 1793, there were such immense flocks of snipes settled along the south-eastern coast of France, that they were taken in cart-loads. They were so weak and feeble, that the peasants used to knock them down with their hands or their hats. As this occurred when the revolutionary frenzy was at its height, the country people thought the presence of these birds, in such multitudes, was a miracle; and very few, in consequence of this notion, were eaten.

The localities for good snipe shooting are, in England, Cambridgeshire, Lincolnshire, and Northamptonshire; and the Essex marshes have been long known and celebrated for this sport. The birds are likewise to be found in Yorkshire, Durham, Cumberland, and Westmoreland. In Scotland they are, on the whole, more numerous than in England. In the former country whisps of thirty and forty are not uncommon in the boggy and marshy lands, near the lochs and rivers which there abound. Ireland, however, carries off the palm in point of abundance. There it is no uncommon achievement to kill forty or fifty brace of these birds in a few hours. They are to be met with in every section of the country. In North and South Wales there is likewise good sport. Twenty brace have been killed among the mountain bogs there in four hours; and this, too, in comparatively unfavourable weather.

We can scarcely move in any direction in South Wales, without meeting with vast numbers of these birds; but they must be sought after and followed in very odd places; and we must never scruple to plunge up to the middle to gain our object. This sport is undoubtedly a very exciting one, but it must be purchased at a certain cost of bodily labour, privation, and discomfort; and only those individuals possessing sound and vigorous constitutions, should follow it.

The time of the arrival and departure of migrating birds, has been thus noted by Mr. Markwright, whose observations extended over a period of twenty-six years:—

	First seen.	Last seen.
Woodcock	October 26	April 1
Snipe	November 20	March 20
Jack-snipe	December 26	March 16
Landrail	September 1	October 20
Quail	August 20	— —
Red-wing	November 20	March 18
Field-fare	November 21	April 10
Royston crow	December 22	March 16
Swallow	April 18	October 31
Swift	May 9	September 3
Cuckoo	May 7	July 10
Wheat-ear	May 4	September 26

CHAPTER X.

THE BUSTARD.

The greater bustard (the *Otis Tarda* of Linnæus) is one of the largest of British game-birds; but it is now rarely met with. It is about four feet long, and from twenty-five to thirty pounds weight; its bill is strong, and rather convex; its eyes are red, and its head and neck are ash-coloured. On each side of the lower bill is a tuft of feathers, from five to nine inches long, the back of which is barred transversely with black and rust colour; the large quill feathers are brown, and the belly white. There are twenty feathers in the tail, those of the middle being of a rust colour, barred with deep black, and those on each side white. The legs are long and naked beyond the knees, and are of a dusky colour. The bird has no hind toe; its nails are short, strong, and of considerable convexity, both above and below, and the bottom of the foot is furnished with a callous prominence, which serves the purpose of a heel. The female bird is smaller in size than the male. The crown of the head of the former is of a deep orange, crossed with transverse black lines; the rest of the head is brown. The lower part of the fore-side of the neck is ash-coloured, and she is destitute of the tuft on each side of the head; in other respects her plumage resembles that of the male, with the exception that the colours of the back and wings are less vivid and glossy. The male is furnished with a kind of *pouch*, capable of containing nearly seven pints of water, the entrance to which is immediately under the tongue. It is supposed that the bird fills this to supply its wants in those dry and thirsty plains which it inhabits. Some naturalists say that the male supplies the female with a portion of the liquid when she is sitting on her eggs. In Morocco, where the hawk is employed to capture the bustard, he makes use of his *pouchful* of water as a means of defence; for, whenever the hawk is coming upon him, he spirts it out upon his foe, and thus endeavours to escape the consequences of his capture. The female bustard makes no kind of nest, but simply scratches a hole in some dry field, and drops two eggs upon the ground, as large as those of a goose, and of a pale olive brown, dotted irregularly with a number of small dark spots, resembling the brown colour of the plumage. She sits thirty days, and watches them with great jealousy; and it is said, if any one handles them in her absence, she immediately abandons them.

Bustards feed on corn and vegetables of various kinds; they likewise devour great quantities of earthworms. Like the ostrich, they even swallow small pebbles, and bits of

metal. Buffon relates a somewhat strange story of one that was opened before the Royal Academicians of France; in the stomach of which there were *ninety doubloons*, all worn and polished by the attrition of the coats of the stomach.

Shooting the bustard was once a very favourite sport with the gentlemen of England. Then, however, they were more plentiful. In autumn they appeared in the largest numbers. Sometimes as many as fifty or more would be seen together near the Downs in Wiltshire. In Scotland the bird is supposed to be quite extinct. In former days, all sorts of contrivances were invented to gain upon the wary bird; carts and coaches, in which gunners were concealed, was a favourite plan; and Markham tells us, that in his time (nearly two centuries and a-half ago), the *stalking-horse* was the surest mode of capture. It was a great achievement to get a shot at the bird, and a still greater to kill him. It was not an uncommon thing for even greyhounds to course the bustard—as it displays always a great reluctance to take wing, and is often successfully overtaken by the dogs, and secured.

About thirty years ago, two fine male birds were shot in Northumberland, which weighed nearly twenty-five pounds each. Salisbury Plain has long been noted for them; but we believe, at the present hour, they are but seldom seen, even in this favoured locality. There have been a few stray birds taken in the high grounds in Wales, within the last ten years. They are very common in Russia, Germany, and Tartary.

The *Little Bustard* (*Otis Tetrax*, Linnæus). This is a smaller species of the bird, being sixteen inches in length, and thirty-five in breadth, with outstretched wings. Its weight is about twenty-five ounces. Bewick says—"It is very uncommon in this country; we have only seen two, both of them females. It is, however, common in France, where it is taken in nets, like the partridge; but it is not an easy prey, being a very shy and cunning bird; if disturbed, it flies two or three hundred paces, not far from the ground, and then runs away much faster than any one can follow on foot. The female lays in June, to the number of three or four eggs, of a glossy green; and, as soon as the young are hatched, she leads them about as the hen does her chickens, and they are able to fly about the middle of August."

In India the bustard is a favourite table bird; but even thousands of gastronomes in this country, if it were brought to table, would be at a loss to know what it was. Colonel Montague tells us that, in 1804, one was shot and taken to Plymouth market, where a publican purchased it for one shilling—what would have fetched two or three guineas where its value was known. This rare wanderer was, however, so entirely unknown, that it was rejected at the second table as improper food, in consequence of the pectoral muscle differing in colour from the other parts of the breast—a circumstance not unusual in birds of the grouse kind. Some country gentlemen supping at the inn the following evening, and hearing of the circumstance, desired that they might be introduced to the princely bird, and, at their repast, partook of it cold.

CHAPTER XI.

FEN-BIRDS.

The term "fen-birds" embraces a numerous class, all breeding in the fens—which, by the way, are fast disappearing before the march of progress—but roving into different localities, especially during the first part of the year. They consist of wild ducks, geese, gargerries,

or summer teal, pochards, shovellers, teals, pewits, gulls, terns, herons, bitterns, coots, water-hens, water-rails, ruffs and reeves, knobs, redshanks, lapwings, and many others. This enumeration is sufficiently full to indicate the varied character of the feathered population of the fens.

THE BITTERN.

This bird is the *Ardea Stellaris* of Linnæus, and bears a strong resemblance to the heron family, only it is smaller, and has a different plumage. The feathers on the top of its head are black; and those on the hind part of the head, neck, and breast, are long and loose. The general colour of the bird is a dull, pale yellow, but variegated with spots and bars of black. The greater covert and quill feathers are ferruginous, and regularly barred with black. The tail is short, and the legs of a pale-green hue; the toes and claws are very long and slender, and the middle claw is serrated on the inner edge. The female is somewhat less than the male, with a plumage less bright, the feathers on the neck not being so long and flowing. Its bill is considerably shorter than the bill of the heron, and likewise weaker. She makes her nest in April, among rushes and sedges, and is, in all respects, a regular visitor of the fen districts. She lays from four to six eggs, which are of a pale greenish ash colour, and sits twenty-five days. When they are hatched, the young have the appearance of being all legs and neck, and never venture from the nest until about twenty days after they are hatched, during which time they are carefully watched and fed by the old birds. Their common food are slugs, small fish, and frogs. In February and March, the male bitterns make a deep hollow noise, morning and evening, which ceases after the breeding season commences. This is called the *booming* of the bittern, and has been often noticed both by poets and naturalists. It is observed, in the *Ornithological Dictionary*, that "those who have walked, on a summer's evening, by the sedgy sides of unfrequented rivers, must remember a variety of notes from different water-fowl, the loud scream of the wild goose, the croaking of the mallard, the whining of the lapwing, and the tremulous neighings of the jack-snipe. But of all these sounds there is none so dismally hollow as the *booming* of the bittern. It is impossible for words to give those who have not heard this evening call, an adequate idea of its solemnity. It is like the interrupted bellowing of a bull, but hollower and louder, and is heard at the distance of a mile, as if issuing from some formidable being that resided at the bottom of the waters. This is the bittern, whose windpipe is fitted to produce the sound for which it is remarkable—the lower part of it, dividing into the lungs, being supplied with a thin loose membrane, that can be filled with a large body of air, and exploded at pleasure. These bellowing explosions are chiefly heard from the beginning of the spring to the end of autumn, and are the usual calls during the pairing season. From the loudness and solemnity of the note, many have been led to suppose that the bird made use of some external instrument to produce it, and that so small a body could never eject such a volume of tone. The common people are of opinion that it thrusts its bill into a reed, which serves as a pipe for swelling the note above its natural pitch; while others imagine that the bittern puts its head under water, and then, by blowing violently, produces its boomings. The fact is, that the bird is sufficiently provided by nature for this call, and it is often heard where there are neither reeds nor water to assist its sonorous invitations. It hides in the sedges by day, and begins its call in the evening, booming six or eight times; and then, discontinuing for eight or ten minutes, it renews the same sound. In Scotland, the sound of the bittern is so very common, that every child is familiar with it, though the birds, from being shy, are not often seen. The poet Thomson seems to have had a very erroneous opinion of the manner in which the bird produces this noise, when he says—

> "So that scarce
> The bittern knows his time, with bill engulfed,
> To shake the sounding marsh.'

On the contrary, we have repeatedly remarked that the bittern usually booms while flying high in the air. Its lofty spiral flight is, indeed, a matter of common remark—

> "Swift as the bittern soars on spiral wing.'

A line which, we may remark, is not very ornithological, inasmuch as neither the bittern nor

any other kind of bird has spiral wings. Southey, however, seems to have been well acquainted with the boom of the bittern—

——"At evening, o'er the swampy plain,
The bittern's boom came far."

The shooting of the bittern scarcely merits the name of sport, as their numbers are limited, and they are seldom sought for as especial objects of game. They are easily brought to the ground. They rise heavily on the wing, and move forward with a slow and deliberate motion, and are, therefore, a good mark for the fowler. Sometimes, however, they will rise rapidly, with a spiral motion; and when this is the case they are not so readily shot. A double gun is of advantage in seeking for this shy bird. When wounded it fights hard; and when driven to extremity, will attack a man with vigour, striking his legs with its bill, and even in some cases aiming a blow at his head. This bird was once held in high esteem at the tables of the great, and is still highly prized by the real sportsman.

THE HERON.

This noble-looking bird is the *Ardea Major* of Linnæus; and has been described by Buffon as "a picture of wretchedness, anxiety, and indigence, condemned to struggle perpetually with misery and want, and sickened by the restless cravings of a famished appetite." How such a description could have fallen from the pen of the great French naturalist we are at a loss to divine; as, throughout the whole scheme of creation, there is no animal, in a natural state, doomed to a life of perpetual wretchedness. The bird is just as happy as any other bird; and it follows its instinctive habits with the same unerring regularity as do the members of every other tribe of the feathered creation. It is seen to stand for hours fixed like a stake to a given spot—no evidence of life in it—waiting patiently for the moment to arrive when the trout or the minnow shall come within the range of its long cranked neck. Its movements are among the wonders of this class of fen-birds; and if patience is a virtue, then the heron is abundantly endowed with it.

The heron has a wonderful capacity of stomach. It may be said literally to swallow no end of fish. Some young birds have been known to consume fifty small roach in a day. These birds make their nests of pieces of stick, lined with wool and feathers; and the female lays five or six eggs, of a pale green colour. During incubation, the male bird passes much of his time perched by the side of the female. They abandon their nests during the winter season, except in the month of February, when they return to them, and put them into a state of repair.

In the sport of hawking, the heron, in ancient times, was a frequent victim; but it had a means of defending itself which may not be known to the generality of our readers. A note in the *Booke of St. Alban's*, says—"The heron, or heronsew, is a fowl that liveth about waters, and yet she doth so abhorre raine and tempests, that she seeketh to avoid them by flying on high. She hath her neste in very loftie trees, and showeth, as it were, a natural hatred against the goss-hawk, and other kinds of hawks; and so, likewise, doth the hawk seek her destruction continually. When they fight above in the aire, they labour both especially for this one thing, that the one might ascend and be above the other. Now, if the hawk getteth the upper place, he overthroweth and vanquisheth the heron with a marvellous earnest flight; but if the heron get above the hawk, then with his dung he defileth the hawk, and so destroyeth him, for his dung is a poison to the hawk, rotting and putrefying his feathers."

The heron seldom weighs more than three or four pounds, notwithstanding it measures about three feet in length; and the breadth of its wings, from tip to tip, is above five feet. The bill is full six inches long, straight, pointed, strong, and serrated; and the upper mandible is of a yellowish horn colour, dark towards the ridge, whilst the under one is yellow. A bare skin is extended from the beak towards the eye, the irides of which are yellow, which imparts to them a fierce and penetrating look. The brow and crown of the head are white; the eyes bordered by black lines, which stretch to the nape of the neck, where they join a long, flowing, pendent crest of the same colour. The upper part of the neck, in some birds, is white; in others pale ash colour; and the fore part, lower down, is spotted with a double row of black feathers; those falling

over the breast being long, loose, and unwebbed. The shoulder and scapular feathers are likewise of the same kind of texture, of a grey colour, generally streaked with white, and spread over its down-clothed back. The ridge of the wing is white, the coverts and secondaries lead-coloured, and the bastard wings and quills are of a bluish black, as are also the long soft feathers which take their rise on the sides under the wings. These fall down, meet their tips, and hide all the under parts; the latter, next the skin, being covered with a thick, matted, dirty-white down, except about the belly and vent, which are almost bare. The tail is short, and consists of twelve feathers of a brownish-red colour. The legs are a dirty green, long, bare above the knees, and the middle claw is jagged on the inner edge.

The female differs from the male in not possessing the long flowing crest, or the long feathers which adorn the breast of the male. The entire plumage of the female is comparatively subdued and uninteresting.

Shooting the heron may generally be referred more to chance than any settled plan of sporting with the gun. The extreme shyness of the bird renders it difficult to be got at; and it is commonly only by accident that the sportsman falls upon it and secures it. When not fatally wounded at first, it will turn upon both the shooter and his dog, if he has one; and, with its hard-pointed bill, it can inflict a sharp wound. One that was shot in the north of England, dropped a trout of ten inches out of its mouth. On the dog approaching it, he was struck upon the forehead by the bird's bill, and a wound more than half an inch deep was inflicted. Such occurrences are far from being rare in the shooting annals of this curious specimen of the fen-birds.

In England, herons were, for centuries, considered royal game, and protected as such by the law. Whoever destroyed their eggs was liable to a penalty of twenty shillings for each offence. When heron-hawking was a favourite diversion among the nobility and gentry, the bird was considered a rich dainty at their tables. The heron has been partially tamed. Sir John Sebright knew of a full-grown one taken in a decoy, and brought to J. D. Downes, Esq., at Old Gunton Hall. At first, it was crammed with food, and at length became so tame as to follow him on the wing to the distance of some miles, to come into the house when called, and to take food from the hand.

THE GREAT WHITE HERON.

The *Ardea Alba* of Linnæus is seldom found in Great Britain. It is about the same size as the common heron, but stands higher, being longer in the legs. It is devoid of crest, and its plumage is entirely white; its bill is yellow, and its legs black. It is found in considerable numbers in the Russian dominions, and in most of the countries contiguous to the Caspian and Black Seas, and the lakes of Tartary. It is met with in the United States of America from June to October, and is often shot in these parts.

THE NIGHT HERON

Is only about twenty inches in length. The bill is nearly four inches long, slightly arched, strong, black, and inclining to yellow at its base. The skin from the beak round the eye is bare, of a greenish hue, and its irides are yellow. A white line is extended from the beak, and over each eye a black patch, glossed with green, covers the crown of the head and nape of the neck, from which three long and narrow white feathers, tipped with brown, hang loose and waving. The hinder part of the neck, coverts of the wings, sides, and tail, are ash-coloured, and the throat is white. The fore part of the neck, breast, and belly, are of a yellowish white, approaching to buff; the back is black, and the legs a greenish yellow. The female bird is nearly of the same dimensions; but she differs considerably in her plumage from the male. The former is less bright, distinct, and vividly portrayed; neither has she the delicate plumes which flow from the head of the male. It is unnecessary here to describe the "Stork" and the "Crane;" for, although they are birds similar to the heron, they are now rarely met with in this country.

This bird frequents the sea-shores, rivers, and inland lakes and marshes, and lives upon crickets, slugs, frogs, reptiles, and fish. During the day it lies concealed, and does not roam abroad until the approach of nightfall. It is known by its rough, harsh, discordant cry,

which is by some compared to the noise made by a person trying to vomit. The female builds her nest on rocky cliffs, and lays three or four white eggs. Both male and female are very difficult to shoot, on account of their extreme wariness.

THE RUFF AND REEVE.

The *Ruff* is the *Tringa Pugnax* of Linnæus, and is the name given to the male; whilst the *Reeve* designates the female of this species of fen-bird. The length of the ruff is about twelve inches, and its weight ranges between six and eight ounces. The bill is about an inch long, and is tipped with black, but reddish at the base. The distinctive mark which separates the male from the female is a singularly wide-spreading, variegated tuft of feathers, which, in the breeding season, grows out of his neck. This tuft, a portion of which stands up like ears behind each eye, is in some black, in others black and yellow, and, in rare cases, white, russet, or barred with glossy violet, black and white. The entire face of the bird is covered with reddish tubercles, or pimples; the wing-coverts are brownish ash-colour; the upper parts and the breast are generally marked with transverse bars, and the scapulars with roundish shaped, glossy black spots, on a rusty-coloured ground. The quills are dusky; the belly, vent, and tail-coverts are white. The tail is brown, and the four middle feathers in it barred with black. The legs are of a yellowish hue. The male does not acquire the ornament of his neck till the second season, and, before that time, is not easily distinguished from the female, except by being larger. After moulting, at the end of June, he loses his ruff and the red tubercles on the face; and, from that time, until the spring of the year, his plumage again resembles that of his mate. This singular tuft in the male bird, it has been remarked, is not a warlike ornament, but only a kind of defensive armour, fitted, by the length, stiffness, and closeness of the feathers, to palliate the blows of an assailant.

The *reeve* is smaller than the ruff, and has no collar round the neck. She is brown in the upper parts, and the middle of each feather is dusky, and the larger quills are of the same hue. The secondaries are of rufous brown, and the legs are yellowish. She lays four eggs in the grass, the ground-colour of which is white, with iron-coloured spots. Among sportsmen it is a rule, understood, not to take the reeves, but to spare them for breeding purposes. When the reeves arrive, the ruff takes to what is called *hilling;* which is selecting a suitable place for pursuing his loves, and which is generally some elevated locality. Each ruff is said to take possession of some small mound, or part of a hill, which he wears quite bare by *hilling*, or breeding upon it.

An erroneous opinion prevails very generally, that ruffs, when in confinement, must be fed in the dark, lest the admission of light should set them to fighting. The fact is, that every bird, even when kept in a room, takes its stand, as it would in the open air; and if another invades its circle, a battle ensues. A whole room full of them may be set into fierce contest by compelling them to shift their stations: but, after the disturber has quitted the place, they have been observed to resume their circles, and become again pacific. In confinement, their quarrels originate in the circumstance of the pan containing their food not being sufficiently large to admit the whole party to feed without touching each other. When the food has been divided into several pans, the birds have remained perfectly quiet.

These birds migrate in the winter, and are then supposed to associate with others of the fen-bird species, among which they are no longer recognised as the ruff and the reeve. In the spring, when they return, they take up their residence in the fenny districts, where they were bred, when they, as a matter of course, become the objects of the fowler's sport.

About Michaelmas is the time for taking these birds; but as few old males are caught, an opinion has been formed that they migrate before the females and young. Is it not, however, more probable that the few which are left after the spring fowling, like other polygamous birds, keep separate from the female and her brood till the return of spring? That some old ruffs are occasionally taken in the autumnal fowling is, perhaps, true; but others declare that none are taken at this season. It must, however, be recollected, that, in the autumn, the characteristic long feathers have been discharged, and, consequently, young and

old males have equally their plain dress; and this circumstance may tend to give rise to the contrary judgments on the matter. It does not appear to be the opinion of fowlers that the males take longer than one season to arrive at maturity; because the ruffs taken in the spring, being without the long feathers, which constitute the principal distinction between them and the reeves, are comparatively few to those possessing the ruff; the opinion, therefore, that these ruffless males are birds of a very late brood of the preceding season, is sufficiently reasonable.

The shooting of the ruff and reeve is principally restricted to the fens of Lincolnshire and Cambridgeshire, and to the Isle of Ely, and the East Riding of Yorkshire. There are likewise a few to be found in the fenny districts in the neighbourhood of Bridgewater, in Somersetshire; but these having been considerably drained of late years, the birds are now scarcer. In the marshy lands between Boston and Spilsby, they may yet be met with in considerable numbers.

THE KNOT.

This is the *Tringa Canutus* of Linnæus, and has a claim upon our notice independent of its being a fen-bird. This claim arises from the derivation of its name. It seems that the Danish king, Canute, was very partial to the flesh of this bird—a circumstance that caused it very often to be served up to him. It therefore came to be known as the bird of Canute, which was pronounced by his subjects *knute*, which, in the course of time, for brevity, and greater facility in the pronunciation, was corrupted to *knot*. It measures about nine inches, and has a tail of a dusky brown colour, of rather more than an inch long. The extent of its wings is about fifteen inches; and its weight is about two ounces eight drachms. The bill is one inch and three-eighths long, black at the tip and dusky, fading into orange towards the base. The tongue is nearly of the same length, and is sharp and horny at the point. The sides of the head, neck, and breast are cinereous, edged with ash-coloured grey: and the chin is white, with a stroke of the same colour passing over each eye. All the upper parts of the plumage are darkish brown, but deeper and glossier on the crown of the head, back, and scapulars; and each feather is edged with ash or grey. The under parts are a cream-coloured white, streaked or spotted with brown on the sides and vent. The great coverts of the wings are tipped with white, which form a bar across them when extended. The legs are of a yellowish hue, and do not measure more than two inches and an eighth, from the middle of the toe to the knee. The thighs are feathered nearly to the knee; and the toes are divided without any connecting membrane.

When the sportsman follows these birds with the gun, they generally run very fast; and it always requires considerable labour and time before he can make them rise within a fair range. Their flight is quick and unsteady. When severe frost sets in, they betake themselves to the sea-shore, where they are more readily brought down than upon the fenny marshes. In Lincolnshire, they are, in large numbers, decoyed into nets, by carved wooden figures painted to represent themselves, and placed within the nets, much in the same manner as the ruff is taken. The knot is likewise fattened for sale, and esteemed by many equal to the ruff in delicacy of flavour. The best season for its capture is from August to November.

THE RED SHANK.

This bird is also called the Pool Snipe, and is the *Scolopax Calidris* of Linnæus. It is a favourite with many sportsmen, as it affords them a good deal of amusement at certain periods of the year. Its length is twelve inches, its breadth twenty-one, and its weight about five ounces and a-half. The bill, from the tip to the corners of the mouth, is nearly two inches long, blackish at the point, and red towards the base. The feathers on the top of the head are dark brown, edged with a pale rufous hue. Over each eye there is a whitish line, from the corners of which, dark brown spots extend to the beak. The irides are hazel. The back part of the neck is obscurely spotted with dark brown, on a rusty ash-coloured ground. The throat and fore part are more distinctly marked, or streaked with spots of the same colour. The breast and belly are white, tinged with an ash colour; the spots are thinly distributed, and are shaped something like the heads of arrows or darts. The general

appearance of the upper parts of the plumage is glossy olive-brown; and those on the shoulders, scapulars, and tertials are transversely marked with the same coloured waved bars, on a pale rusty ground. The bastard wing and principal quills are dark brown; and the inner webs of the latter are deeply edged with white, freckled with brown; and some of those quills next the secondaries are beautifully marked, near their tips, with narrow brown lines, exactly pointed, and shaped to the form of each feather. Several of the secondaries are barred in the same manner, and some are white. The back is white; the tail-feathers and coverts are elegantly marked with alternate bars of dusky grey and white. The middle ones are slightly tinged with russet. The legs are red, and measure, from the end of the toes to the upper bare part of the thigh, four inches and a-half.

This bird is solitary in its habits, being usually found alone, or in pairs only. Its habitation is among the fens, or in wet or marshy lands, where it rears its young. It lays four eggs, of a whitish hue, tinged with olive, and freckled with irregular spots of black, chiefly on the broad end of the egg. When disturbed, it wheels round its nest in the air, and utters a cry similar to the lapwing. It is not very easily shot, on account of the spiral motion it makes, and the rapidity of its flight; but it gives excellent sport to a young shooter.

THE GODWIT.

This is the *Scolopax Ægocepala* of Linnæus, of which there are several varieties: its difference of plumage is to be regarded as a mark sufficiently strong to determine this. Its length, from the extreme end of the bill to the tip of the tail, is twelve inches, and to the end of the toes, nearly fifteen. Its breadth is twenty-one inches and a quarter, and its weight is five ounces and two drachms. The bill is slenderly formed, measuring two inches and a-half from the corners of the mouth to the tip, and is, for half its length nearest to the base, of a reddish hue, and the other part black. The irides are hazel. The head, breast, neck, and belly, have spotted streaks, mottled and barred with dingy ash-brown and dull white, which become darker towards the hinder part of the neck. The throat is white; and lines of the same colour pass from the upper sides of the beak over each eye, from the corners of which two brown ones extend to the nostrils. The shoulders, scapulars, lesser coverts, and tail, are of a glossy olive-brown. The feathers on all these parts are indented on the edges, in a greater or less degree, with triangular-shaped white spots. The back is white, and the rump barred with waved lines of ash-coloured brown and dingy white. The feathers about the vent are marked in a similar manner, but they have a larger proportion of white. The tail and coverts are likewise barred with narrow waved lines, of a dull ash-colour; and, in some specimens, are nearly black and white. Five of the principal quills are dark brown, tinged with olive; the shaft of the first quill is white; the next six are, in the male, rather deeply tinged with white, and slightly spotted, barred with brown. The secondaries, as far as uncovered, when the wings are extended, are of the same snowy whiteness as the back. The feathers which cover the upper part of the thighs, and those near them, are bluish, with a reddish or vinous hue. The legs are of a deep orange red, and measure, from the end of the middle toe-nail to the upper part of the thigh, five inches and a-half. Colonel Montague says there is a larger kind of *godwit* than this, weighing twelve ounces, and measuring about eighteen inches in length.

This bird was known formerly as a permanent resident amongst us, resorting to the fens from the moors, where they were taken by means of a *stale* or stuffed bird, after the manner of the ruff and reeve. Towards the winter the godwit may be seen at the mouths of many of our large rivers, and it is then a very popular object of pursuit to water-fowl shooters. At Hudson's Bay, it packs in such numbers, that there have been fifty and sixty of them killed at one shot.

There is another variety of the above. This has the greater covert of its wings so deeply margined with light grey-brown as to appear almost all white at a distance, and the sides of the body have a few long streaks of brown. The bird is met with in various parts of Europe, Asia, and America; and in Great Britain, in the spring and summer, it takes up its residence in the fenny districts and marshy grounds, where it feeds upon small worms and insects.

During these seasons it only removes from one boggy locality to another; but when severer frosts set in, it betakes itself to the salt-marshes and sea-shores. The flesh of the godwit is highly esteemed by epicures, and sells at a high price.

THE WHEAT-EAR.

This small bird is known in the Linnæan System as the *Motacilla Œnanthe*, and is often shot on Brighton Downs: it is taken in some neighbouring localities in great numbers. This is accomplished by means of two turfs placed on edge, at each end of which a small horse-hair noose is fixed to a stick, which the bird, either in search of food or to evade a storm of rain, attempts to get under, and is caught. Colonel Montague says—"In confinement they are almost continually in song, and sing by night as well as day; they have a very pleasant, variable, and agreeable song, different from all other birds: sometimes it is very loud; and they continue it a great length of time, not continually breaking off like a robin-redbreast and some other birds; but their winter song is best and most varied." In allusion to the migratory habits of this bird, Miss Charlotte Smith has written some beautiful lines; but we have room only for one stanza, which is sufficient to indicate the happy spirit in which they were composed:—

> "From that deep-sheltered solitude
> Where, in some quarry, wild and rude,
> Your feathered mother reared her brood,
> Why, pilgrim, did you brave
> The upland winds, so bleak and keen,
> To seek these hills, whose slopes between,
> Wide stretched in grey expanse, is seen
> The ocean's toiling wave?"

THE LANDRAIL.

The landrail is also called the corncrake, and is the *Rallus Crex* of Linnæus. Bewick describes it as rather more than nine inches long, and its general bulk of body as considerably compressed. The bill is light-brown, and the eyes hazel. Most of the feathers on the upper part of the plumage are of a dark-brown hue, edged with pale rust; both winged coverts and quills are of a deep chestnut colour. The fore part of the neck and breast are pale and ash, and a streak of the same colour extends over each eye, from the bill to the side of the neck. The belly is a yellowish white, and the thighs, sides, and vent, are marked with faint rusty-coloured bars. The legs are a pale flesh-red.

The landrail is migratory in its habits, and makes its appearance in this island about April. Cornerakes, says Mr. Daniel, "are plentiful in these realms, and in Ireland particularly so, where it is probable they pass the winter. They are in the greatest plenty in the Isle of Anglesea, where they appear about the third week in April, supposed to come there from Ireland. At their first arrival it is common to shoot seven or eight in a morning. They abound in the county of Caithness, in Scotland, and are found in most of the Hebrides and the Orkneys. Few places in England are destitute of them in summer; but they are nowhere what may be called common. It is observed, that wherever quails are in plenty the crake abounds. On their first appearance in England, they are so lean as to weigh less than six ounces; but, before their departure, have been known to exceed eight, and are very fat. Their flesh is considered excellent."

The cry of the landrail is well known, and when once heard, cannot be readily forgotten. It shelters among the long grass, and is rarely seen, for it invariably hides among the thickest parts of the herbage, and runs so quickly, that it is, in nine cases out of ten, impossible to overtake it. When hard pressed by a dog, it will sometimes instantaneously stop and squat down, by which device the dog runs past, and loses the trace of it. It seldom springs but when driven to extremity, and generally flies with its legs hanging down, but never to any great distance. When it alights, it begins to run with surprising speed; and before the fowler gains the spot, is far out of his reach.

The nest of the bird is formed of dry grass, a few soft leaves, and a little moss mixed up with the whole. It is commonly imbedded in some hollow part of the surface of the ground, but occasionally is met with on high and even places. The female lays ten or twelve eggs, of a dull white colour; and the young, as soon as they escape from the shell, are capable of running with wonderful swiftness.

The landrail departs from England before

the winter, and repairs to other countries in search of its food, which principally consists of slugs, of which it destroys a prodigious quantity. It likewise devours worms and insects, as well as seeds of various kinds. Mr. Pennant thinks that most of the birds which leave us in spring, to spend the summer elsewhere, have been traced to Lapland—a country of lakes, rivers, swamps, and alps, covered with thick and gloomy forests, that afford shelter during summer to the fowls which, in winter, disperse over the greater part of Europe. In these arctic regions, in consequence of the thickness of the woods, the ground remains soft and penetrable to the woodcocks, and other slender-billed fowl. Some, on the other hand, think that they take the opposite direction, and in place of flying to Lapland, *make wing* to Africa. The cause of the migration of birds is ascribed, by Pennant, to the deficiency of food at certain seasons, or the want of a secure asylum from the persecutions of man during the time of courtship, incubation, and nutrition.

It is difficult sometimes to get a shot at this bird, from the peculiarity of its habits.

PLOVERS.

The *Great Plover* is the *Charadrius Œdicnemus* of Linnæus; but by some writers it is called the *stone curlew*, and Norfolk plover, and considered a diminutive type of the bustard. It is about sixteen inches long, with a bill of moderate length; eyes and eyelids of a pale yellow hue, with a pale streak above and below, which forms a very characteristic mark. The upper parts of the body are tawny brown, and, on each feather, there is a dark streak down the centre. The fore part of the neck and breast are nearly of the same colour, but much paler. The belly, thighs, and vent are of a pale yellowish white, and the quills are black. The tail is short and rounded, and a dark band crosses the middle of each feather. The tips are black, and the rest white: the legs are yellow, and naked above the knees, which are very thick, as if swollen; and its claws are black.

This bird is very frequently found in Norfolk; and Mr. White observes, that the district of Selborne, in Hampshire, is one of its favourite spots. In the north of England it is little known. It frequents dry and stony places, by the sides of sloping banks, and makes no nest. The female lays two or three eggs on the bare ground, sheltered by a stone, or in some small hole formed in the sand. These are of a dirty-white colour, marked with deep-red spots, mixed with slight streaks. Although this bird has great power of wing, and flies with great strength, it is seldom seen during the day, unless surprised, when it springs to some distance, and commonly makes its escape before the sportsman gets within gun-shot. It runs along the ground nearly as swiftly as a dog. After running some time, it suddenly stops, holding its head and body still, and, on hearing the least noise, squats close to the ground. In the evening it comes out in quest of food, and may then be heard at a great distance. Its cry is singularly hoarse, and has been compared to the turning of a rusty handle. Its food consists chiefly of worms. It is said to be tender and savoury eating when young; but, when aged, to be hard, dry, and black. In White's *History of Selborne*, it is stated that the young run immediately from the nest almost as soon as they escape from the shell, and that the female leads them to some stony field, where they bask among the stones, to which they bear so close a resemblance, in point of colour, as not easily to be discovered.

The Great Plover is migratory in its habits, and arrives in this country in April. It remains with us all the spring and summer, and, at the commencement of autumn, prepares to take leave by getting together in flocks. It is supposed that these plovers retire to Spain, and frequent the sheep-walks with which that country abounds.

Like the Landrail, it is difficult to obtain a shot at it, from the celerity with which it runs over the ground.

THE LAPWING, OR PEWIT.

This is the *Fringilla Vanellus* of Linnæus, and is a common bird among sportsmen. It falls in his way in every direction, where there is poor, barren, and moist land. Its weight is about eight ounces. The plumage, taken altogether, is beautiful, and the male and female greatly resemble each other; the latter, however, being rather the smaller of the two. It is a well-known bird, chiefly by its singular

cries when flying, and its motions are full of variety. The female lays four eggs, of a dirty-olive colour, spotted with black, which she deposits in some small indentation in the ground, having previously made a rude nest of a little dry grass and heather. The young brood, as soon as they leave the shell, are capable of using their limbs, and the parent bird displays a great deal of tenderness and solicitude over them.

The Lapwing is found in most parts of Europe, as far northward as Iceland; and, in the winter, it is met with in Persia and Egypt. Its chief food is worms; and sometimes flocks of this bird may be seen covering low marshy grounds in search of these, which they draw with great dexterity from their holes. When the bird meets with one of those little clusters of pellets, or rolls of earth, that are thrown out by the perforations of worms, it first gently removes the mould from the mouth of the hole, then strikes the ground at the side with its foot, and steadily and attentively waits the issue: the reptile, alarmed by the shock, emerges from its retreat, and is instantly seized. In the evening the birds pursue a different plan. They run along the grass, and feel under their feet the worms, which now come forth, invited by the coolness of the air. Thus they obtain a plentiful meal; and afterwards wash their bill and feet in the small pools or rivulets.

"I have seen this bird," says Dr. Latham, "approach a worm-cast, turn it aside, and, after making two or three turns about, by way of giving motion to the ground, the worm came out, and the watchful bird, seizing hold of it, drew it forth."

The Lapwing remains in England the whole year. The parent exhibits the greatest attachment to her young; and the arts she employs to allure boys and dogs from the place where these are running, are extremely amusing. She does not wait the arrival of her enemies at the nest, but boldly pushes out to meet them; when, as near as she dare venture, she rises from the ground with a loud screaming voice, as if just flushed from hatching, though probably, at the same time, not within a hundred yards of her nest. She now flies, and makes a great clamour, and appears extremely disturbed; whining and screaming round the invaders, striking at them with her wings, and sometimes fluttering as if she was wounded. To complete the deception, she becomes still more clamorous as she retires from the nest. If very near, she appears altogether unconcerned; and her cries cease in proportion as her fears are augmented. When approached by dogs, she flies heavily, at a little distance before them, as if maimed; still vociferous, and still bold, but never offering to move towards the quarter where her young are stationed. The dogs pursue, in expectation, every moment, of seizing the parent, and, by this means, actually lose the young; for the cunning bird, having, by her stratagems, drawn them off to a proper distance, exerts her powers, and leaves her astonished pursuers to gaze at the rapidity of her flight.

There are few readers acquainted in any degree with the country, who will not recollect how justly the following lines describe the manners of this bird:—

> ——————"Hence, around the head
> Of wand'ring swains, the white-wing'd plover wheels
> Her sounding flight; and then directly on,
> In long excursion, skims the level lawn,
> To tempt him from her nest."

At certain seasons these birds search the dry heather of the downs for insects and grubs; and, not long after, they are found feeding on shell-fish in the moist and swampy ditches. They are fine eating, and their eggs bear a high price in the market.

To shoot them with certainty requires considerable practice; but, on the whole, when on the wing, their mode of flight is favourable to the shot telling upon them in vital quarters. No. 4 shot is generally recommended for this bird.

THE GOLDEN PLOVER.

This is the *Charadrius Pluvialis* of Linnæus, and is described as being about seven or eight ounces in weight, and its length about ten inches and a-half. The bill is a little more than one inch in length, dusky in its hue. The irides are hazel. The general plumage above is dusky, spotted with greenish yellow, brighter on the back and scapulars, and palest on the wing-coverts. The sides, head, and neck of the body are lighter-coloured; and the middle of the belly and vent are white. The

quills are dusky, slightly margined at the tip with grey. The tail is also dusky, spotted with yellow, and of a white hue. The legs are black.

The golden plover is very common in this country, and is pretty generally distributed over Europe. In America it is very numerous, from Hudson's Bay as far as Carolina, migrating from one locality to another, in accordance with the seasons that produce its food. The male and female are very nearly alike in size and plumage. In young birds the yellow spots are not very strongly marked, as the plumage, during the time of their growth, inclines more to a grey hue.

These plovers were formerly taken in great numbers by means of a stalking-horse. When fired at, they fly over you, darting down for the moment, and separating in every direction; so that by taking a random shot with the first barrel, you may often bring them down to get a fair shot with the second.

THE GREY PLOVER.

This is the *Tringa Squatarola* of Linnæus, and is about eleven or twelve inches long, and varying from twenty-four to twenty-five broad. Its general weight is about seven ounces. The bill is black: the head, back, and wing-coverts are of a dull dusky brown, edged with greenish ash-colour, and some with white. The cheeks and throat are white, and marked with oblong dusky spots. The belly, sides, and rump are white, the sides being marked with a few scattered dusky spots. The outer web of the quills is black; and the lower parts of the inner webs of the first four are white. The feathers of the tail are marked with alternate bars of black and white. The legs are of a dull green hue, and the hind toe is small.

This bird is not very common in Great Britain, but is occasionally met with in large flocks on the sea-coast. Its flesh is esteemed a great delicacy. In cold and frosty weather, grey plovers seek their food on lands near the sea-shore; and when the sky is clear they frequent ploughed fields, especially if sown with grain. After feeding they make for some water, in which they wash their beaks and feet, and seem to take great delight in so doing. In the night they run up and down, feeding on worms, which they devour in large numbers. The bird is very common in Ireland, where it is found in immense numbers. Being a shy bird, it is difficult to get near enough to shoot it.

THE WATER-RAIL.

This is the *Rallus Aquaticus* of Linnæus, and is a curious specimen of the fen-bird. It resembles the landrail in general appearance and figure, but is quite distinct in habits and instincts. The water-rail is one day couched in the long grass of a high district, and in the next is squatted on, or flying about, the marshy and boggy grounds. When hunted closely it may be readily sprung, and makes a passable shot. Colonel Montague thus writes of it:—"It seldom takes wing, but dives on the least alarm, and will remain under water, amongst the reeds or other aquatic plants, with only its bill above, for respiration. Its nest is formed, like the rest of the grebes, of a prodigious quantity of flags, or other water-plants, but is generally fastened to the reeds, or flags, in order to prevent its being carried away by the current. Temminck gives a similar statement. The eggs are five or six in number, of a dirty white; the shape oblong, and less than those of the pigeon. These are generally covered with weeds, so that when the bird quits her nest suddenly, they are not exposed to view. In large rivers, these birds are frequently devoured by pike and trout while they are diving in pursuit of small fish. We once took from the stomach of the last, a water-rail weighing fifteen ounces, the trout only weighing four pounds. After the breeding season, the bird is frequently found in some of our inlets of the sea, where it is said to feed on shrimps."

THE GALLINULE, OR MOOR-HEN.

This is the *Fortica Chloropus* of Linnæus, and in many of its habits, it is very like the water-rail. It is not met with in any great numbers; but its species are scattered, here and there, over almost every country. We believe it is not positively ascertained whether they are migratory; but it is well known that they change their place according to the seasons of the year; frequenting elevated tracts in summer, and more sheltered parts in winter. It is very common in Britain; and sportsmen fall in with it mostly on the borders of rivers and ponds, where willows and sedges grow.

Mr. Daniel says—"It is like the water-rail; it conceals itself during the day; and in the evening it runs and skulks by the margin of the waters, among the roots of the bushes, oziers, and long loose herbage which overhang the banks, in quest of its food, which consists of insects, worms, aquatic plants, and seeds. It will likewise pick up corn from the neighbouring stubbles, and is at all times very good eating; but from September to December the flesh is extremely delicious."

The nest of the female moor-hen is composed of reeds and rushes woven closely together, and is placed in some corner or chink by the side of water, or upon the stump of an old root. She lays seven eggs, which are about two inches in length, of a yellowish-white hue, marked with a goodly number of irregular spots, of a reddish colour. Some writers affirm, that during incubation, she never leaves the nest without covering the eggs with leaves. She has two, and sometimes three, hatchings during the summer; and the young take to the water very soon after they leave the shell.

The length of the bird is about fourteen inches; the breadth twenty-two; and the weight from twelve to fifteen ounces. The bill is red, with a greenish-yellow tip, and about an inch long. The head is small and black, with the exception of there being a white spot under each eye. The irides are red. The colour of the plumage is sooty black, tinged with shining olive-green. The outer edge of the wing, outside feathers of the tail, and under-tail coverts, are of a dull or dingy white. The colour of the legs is of a pale yellow, often shading off to a dark green. The toes are very long; sides broad; and these are furnished with membranous edgings, which enable the moor-hen to swim, and run rapidly over the surface of slimy mud. Its feathers are thickly set, and bedded in down.

This bird is difficult to shoot in the water, as it dives the moment it sees the flash of the gun. The best method of killing it is to aim a little below it in the water. This plan is often successful.

THE COOT.

This is the *Fulica Atra* of Linnæus, and is well known throughout England, as it permanently resides here. Its usual weight is about twenty-eight ounces; and it is fifteen inches in length. The bill is of a greenish-white hue, and about an inch and a quarter long. The irides are red. The upper portion of the plumage is black, except the outer edges of the wings, and a spot under each eye, which are white. The under parts of the body are of a hoary dark ash or lead colour; and the skin is protected with a coat of thick down, coated with feathers closely bedded together. The thighs are placed far behind, and are strong, fleshy, and yellow above the knees.

The common coot has, in many of its characteristics, so striking a resemblance to the water-rail and moor-hen, that many writers have considered them as belonging to the same species. Others, however, think it a distinct genus, chiefly on account of its being fin-footed, and from its great attachment to water, whith it seldom leaves. With this bird naturalists commence to arrange the general tribe of swimmers, and place it among those that mostly depend on the watery element for their subsistence. It swims and dives with as much ease as almost any other of the aquatic tribes; and, like those which seldom venture on land, it is a bad traveller, and may be said not to walk, but to splash and waddle between one water and another, with a laboured, ill-balanced, and awkward gait.

THE GREATER COOT.

This bird is of a larger size than the last, and differing little in colour or plumage, except in being a shade darker. It is found in Lancashire and in Scotland. In many sections of the European continent it is abundant. There is a curious anecdote told of a bald coot, that built her nest in Sir William Middleton's lake, at Belsay Castle, in the county of Northumberland. The rushes amongst which its fragile home was constructed, having been loosened by a high wind, the nest was forced from its *moorings*, but floated upon the surface of the water, in every direction. Notwithstanding this unexpected event, the female continued to sit, and brought forth her young upon her movable habitation.

For the sake of the culinary department of the household, we give the following recipe for

cooking these birds, as it is from a high authority. After picking them, take off the black down, by means of powdered black rosin and boiling water, and then let them soak all night in cold spring-water. This process makes them look as delicate as a chicken, and become tolerably tender and juicy. Unless this be done, the skin, in roasting, will be oily, and have a strong fishy taste and smell; and when taken off it will become dry, and good for nothing. But, perhaps, the best method is to skin them at once; and after soaking them twenty-four hours in cold spring-water, repeatedly changed, they can be made into a pudding or pie, or into soup. By these means, the skin is got rid of, without losing the juice of the flesh; and their fishy taste is, in a great degree, drawn off by the steam.

The coot is difficult to be flushed, consequently a fair flying shot at it is not always to be obtained. Its suspicious habits keep it from frequently showing itself, and dogs are seldom able to make much impression upon it in rousing it from its lurking-places. They are sometimes pursued in France by two shooters—one on each side of a narrow and sedgy stream—when, with the addition of a couple of industrious dogs, execution is occasionally done, and a few brace bagged in the course of a day. It is, however, only in some favourite locality that success can be realised even in that country, where the birds are more numerous than they are with us. It is not often that these birds are regularly sought after by sportsmen in England; the shooting of them being rather a chance affair than a purposely sought-for sport.

In many of the sedgy and sluggish rivers that lie along the south-eastern portion of the coast of France, coots are very numerous; but the inhabitants in rural districts consider them as birds of evil omen; and whenever they see one fly out from its hiding-place, they cross themselves, and consider the circumstance as portentous of some unhappy event. This may, perhaps, be susceptible of some degree of explanation, when the shy and retiring habits of the bird are taken into account.

THE CURLEW.

The *Scolopax Aquata*, of Linnæus, is a shy bird, and requires some manœuvring to get within range of him. He measures about two feet in length, and, from the tip of each wing, averages about three feet. The bill is full seven inches long, and curved, with a somewhat tender and blunt point. The upper mandible is of a blackish hue, gradually shaded off to a brown towards the base; and the under one is flesh-coloured. The head, neck, and upper part of the back, and wing-coverts, are of a pale brown; and the middle of each feather is black, fringed and deeply indented with pale rust, or light grey. The breast, belly, and lower portion of the beak, are of a dull white, sparsely spotted with black; and the two former with oblong strokes of the same colour, mathematically set. The quills are black, and the inner webs are crossed, or spotted with white. The tail is barred with black, on a white ground tinged with red. The legs are bare a little above the knee, and of a bluish hue; whilst the toes are thick and strong, and flat on the under side.

These birds vary considerably, not only in point of size, but in regard to the colours of their plumage. Their weight ranges from twenty-four to upwards of thirty ounces. In some, the white portions of the plumage are much more distinct and clearly defined than in others, which are more uniformly grey, and tinged with pale brown. The female has a great resemblance to the male, and makes her nest upon the ground, in a dry tuft of rushes or grass, or of such withered materials as are found near the spot. She lays four eggs, of a greenish hue, with brown spots irregularly distributed over them.

The food of these birds consists of worms, insects, and flies, which they pick out of the soft mossy ground, by the pools or water in such parts of the country as they frequent. In winter they seek the sea-shores, where they appear in great numbers, picking up worms, marine insects, and other fishy materials, on the beach, and among the loose rocks and pools left by the retiring tide. The flesh of the curlew has been characterised by some as very good, and of a fine flavour; while others have unceremoniously condemned it. The truth is, when it lives in the moors, and feeds on insects, and such fare as it can gather in the boggy ground, it is excellent eating; but after it has been a short time by the

sea-coast, and obliged to put up with such diet as it can find there, its flesh becomes strong and unsavoury. In former times, the curlew enjoyed a high reputation, as the old proverb tells us:—

> "A curlew, be she white, or be she black,
> She carries twelvepence on her back."

We have already observed that this bird is shy and suspicious, and very difficult to be approached with the gun and dog. The only chance is to steal a march upon it, by getting round some hill, or elevated piece of ground. To bring it down requires rather heavy shot; such as No. 3 and No. 2.

In some districts of Ireland, and in the boggy moor-grounds in all the counties of Yorkshire, Durham, Cumberland, Westmoreland, and Northumberland, the curlew is found in considerable numbers; but as it tries to deceive the sportsman as the plover does, the unwary are often cheated out of their anticipated sport by it. The only way of getting near it, as we have said, is to take the advantage of some cover—a hill, a wall, a bush, or something of the kind: but even with all or any of these screens or aids, it is often surprising to witness with what keenness of sight it will espy an enemy, and how rapidly it will wheel round and get out of the reach of his weapon. What we now state has reference to the birds in the moors and spongy grounds, where, during the summer months, they have taken up their *habitat* for greater safety during the process of incubation. They are more easily approached when they frequent the sea-shore in winter. When they are pursued in the moors, dogs are useless; nay, worse than useless, as they disturb the birds long before the sportsman himself makes any impression upon them. In curlew shooting by the sea-side, dogs are entirely unnecessary.

Punt-shooting for this bird by the sea-side is sometimes followed, and has its share of excitement. It is pursued in autumn, when the birds assemble in large numbers, and roost in some favourite localities, not far distant from each other. These spots require to be well known by the shooters previous to their operations. When they are approached by means of a punt or boat, it should be done in fine frosty weather, and just after or before daybreak. The party should conceal themselves by stooping or lying down in the punt, and then, when within range, a raking fire from each gunner should be made. Sometimes a good bag of birds is obtained in this way.

Besides the curlew proper, there is a species called the *little curlew*, which affords some sport. It is found in considerable numbers on the Essex coast, and in some parts of South Wales. Colonel Hawker says, Langston Harbour, in the Poole district, and Romney Marsh, yield them in abundance; and, therefore, afford good sport.

CHAPTER XII.

SEA-FOWL SHOOTING.

Sea-fowl shooting is attended with little profit to the sportsman beyond what it adds to his health, in the air and exercise which it calls him forth to enjoy. As there are many, however, who take great delight in its pursuit, who love to hear the report of their fowling-pieces awakening the echoes of the crags and cliffs that rear their rugged forms as guardians of the land, against the inroads of the waters of the great deep, we have deemed it worthy of introduction into these pages. It has not much to recommend it in the way of supplying the table with something *good;* but it has associated with it much that is grand and sublime. There is the sea, upon which time, that touches everything else, makes no impression,

and which has been aptly considered as an emblem of eternity. There are, also, the golden sands of the pearly beach, which glitter in the rays of the sun, or glance in the beams of the moon, as the ocean rolls its melodies over their surface; and there are the giant rocks, which, for thousands of years, have frowned defiance to the sea, and which, may-hap, for thousands more, will present their grim fronts to the tempest, whilst sheltering the gull and the guillemot. These are all impressive objects; and, in sea-fowl shooting, are to be taken into the account, when estimating the amount of pleasure which this pursuit may afford.

THE STORMY PETREL.

The *Procellaria Pellagica* of Linnæus, is about the size of the common swallow, and the smallest web-footed bird known. When crossing the Atlantic, we ourselves can well remember the ominous prognostications which a flock of these birds would often draw from the mariners, when the clouds were gathering in darkening masses over us, and portending storms collecting their strength, as it were, with no other object than to doom our ship, and ours alone, to destruction. They are heard generally at night, and are recognised by their shrill and piercing cry. The following description is taken from Loudon's *Magazine of Natural History*:—"As the stormy petrel is scarcely ever seen near the land, except in very boisterous weather, one of the natives of the island of St. Hilda, for a trifling remuneration, agreed to traverse the face of a huge rock, and fetch me some petrels out of its fissures. Accordingly, accoutred with a rope of hemp and hog's bristles coiled over his shoulders, he proceeded to the cliff. Having made one end fast by means of a stake, he threw the coil over the face of the rock, and gradually lowered himself down, but with the utmost caution and circumspection, carefully pressing his foot hard upon the narrow ridges before he at all loosened his firm grasp of the rope, which he never altogether abandoned. I had previously thrown myself upon my chest, to enable me to have a better view of him by looking over the cliff; and certainly, to see the dexterity and bravery with which he threw himself from one aperture to another, was truly grand. The trembling surface of the Atlantic was foaming many hundreds of feet beneath, and dashing its curling, cream-like surge against the dark base of the cliff, in sheets of the most beautiful white; while the heron and black-backed gulls, alternately sweeping past him, so as to be almost within reach of his arm, threw a wildness into the scene by the discordant scream of the former, and the laughing, oft-repeated bark of the latter. This, however, he appeared entirely to disregard; and, continuing his search, returned, in about half-an-hour, with seven or eight of the stormy petrels, tied up in an old stocking, and a pair of the Manx puffins, together with their eggs. The birds, he told me, he had no difficulty in capturing. The eggs of the stormy petrel are surprisingly large, considering the diminutive size of the bird—being as large as those of the thrush. The female lays two eggs, of a dirty or dingy white, encircled at the larger end by a ring of fine rust-coloured freckles. The birds merely collect a few pieces of dried grass, with a feather or two, barely sufficient to prevent the eggs from rolling or moving on the rock." The rope alluded to in this passage is of great value to the St. Kildan. Indeed, he could not pursue his vocation without it; consequently, it often makes the first article in the testament of a father. Of the manner in which it is used, Mr. Macauley gives the following instance, of which he was an eye-witness:—"One of them fixed himself to a craggy shelf; his companion descended about sixty feet below, and having directed himself away from the face of a most frightful rock hanging over the sea, began to play his gambols. He swung merrily, and laughed very heartily; and, after some time, having afforded all the entertainment he could, he returned in triumph, full of his own merit, with a large string of birds about his neck, and a number of eggs in his bosom. When a fowler is under the necessity of descending the rocks, without any assistance from his fellows, he drives a post sloping into the earth, and, by fastening the rope to it, lets himself down thereby, without the help of any person whatever."

THE GULL FAMILY.

It is maintained by some sportsmen that there are eleven species belonging to this

family; but Colonel Hawker extends them to thirteen. They have all a striking resemblance to each other; and their principal characteristics are a compressed bill, elongated and pointed, with the upper mandible turned towards the end, and the lower, underneath, forming a salient angle. Their nostrils, placed towards the middle of the bill, are long, narrow, and bored through. Their tail is full; the legs rather long, and the thumb short. All the gull tribes are more or less objects of the gunner's sport, and the shooting of them is often attended with considerable excitement and pleasure. These birds generally congregate in vast flocks in those parts of the coast that are high, abrupt, and little frequented by either boats or land travellers; where, in fact, the rugged nature of the cliffs, and the air of solitude and desolation around, seem to secure to them comparative safety and retirement. To a man susceptible of the wild and grand in scenery, and with a fowling-piece in his hand, we know of no more attractive pursuit than a ramble along the headlands of the coast, in quest of these birds. Everything around is vast and imposing. The ocean casts a solemn shade over the most volatile mind, and lifts the thoughts to objects of contemplation, that strikingly impress it with the majesty of the Supreme Power. In such sporting rambles among the feathered tribes in this section of Nature's vast domains, the sportsman scans the singular economy that prevails in the congregated families that are here bred and nourished by her paternal hand. He scrambles from one cliff to another, sometimes with fear and trepidation; while he often recognises birds of which he knew little or nothing before; and, perchance casts his eye on the nest of the eagle, whose marauding flights are marked in every direction with blood and rapine.

"High from the summit of a craggy cliff,
Hung o'er the deep, such as, amazing, frowns
On utmost Kilda's shore, whose lonely race
Resign the setting sun to Indian worlds,
The royal eagle draws his vigorous young.
Strong pounced, and ardent with paternal fire,
Now fit to raise a kingdom of their own,
He drives them from the fort, the towering seat,
For ages, of his empire; which in peace
Unstained he holds, while many a league to sea
He wings his course, and preys in distant isles."

These birds abound in far greater numbers in the northern parts of Britain than in the southern. In the Fern Islands, off the coast of Northumberland, and all around the northern and western parts of Scotland, they are to be found extremely numerous, especially in rocky localities. In the Orkney and Hebrides Islands, they afford plenty of good sport; for we conceive that most sportsmen, who have had opportunities of enjoying this species of shooting, must have remarked, that the farther north they went, and the more unfrequented the parts into which they travelled, the less shy the birds became, and the richer the harvest that awaited them.

The weather has a great influence over this sport. All the different kinds of sea-fowl are more approachable in stormy than in calm weather; only the former is not so pleasant to the sportsman himself. But there is no getting all matters to square evenly in sporting practices. The fair must be blended with the foul, even to impart a relish to sport.

THE SWAN FAMILY.

The *Anas* of Linnæus have long held a distinguished place in the eyes of sportsmen. The ancients consecrated them to *Apollo* and the *Muses*. Callimachus, in his hymn upon the island of Delos, celebrates them:—

"When from Pactolus' golden banks,
Apollo's tuneful songsters, snowy swans,
Steering their flight seven times their circling course,
Wheel round the island, carolling meantime
Soft melody, the favourites of the nine,
Thus ushering to birth with dulcet sounds
The god of harmony, and hence seven strings
Hereafter to his golden lyre he gave;
For ere the eighth soft concert was begun
He sprung to birth."

These birds are considered at the head of the web-footed tribes; and to shoot them is, among sportsmen, esteemed a great achievement. The *hoofers*, or wild swans, are very easily killed, if the fire be directed towards the head, or under the wing; but they are almost shot-proof in other parts of their body. The flight of the swan is very rapid. Hearne says—"Notwithstanding their size, these birds are so extremely swift on the wing when in full feather, as to make them more difficult to shoot than almost any others, it being frequently necessary to take sight, say twelve feet before their

bills. This, however, is only when they are flying before the wind in a brisk gale, at which time they seldom fly at a less rate than a hundred miles an hour: but when flying across the wind, or against it, they are not able to make any great progress."

The swan is five feet long, above seven broad, and weighs from thirteen to sixteen pounds. The bill has a length of three inches, and is of a yellowish hue from the base to the middle, and thence to the tip, black. The bare space from the bill over the eye and eyelids is yellow; and the entire plumage, in adult birds, is of a pure white. They are clothed, next to the skin, with a thick fine down. The legs are black.

This species usually congregate together—keeping in groups or families, except at the pairing season, and when the severe frosts set in. In winter they assemble in prodigious numbers, near great rivers and lakes, situated in thinly inhabited countries in the northern parts of Europe, Asia, and America. When the weather becomes very severe, they take their flight very high in the air, and divide their number in quest of a more genial temperature. In such hard winters they are sometimes met with in various sections of Great Britain, and in other more southern countries of Europe. The rule as to their migrations has been observed in America. They do not, however, remain longer than towards the approach of spring, when they retire northward to the arctic regions, to breed. In these movements to and fro, a few straggling birds stop short, and perform the offices of incubation by the way; for it has been ascertained that they breed in the Hebrides, the Orkney, Shetland, and other solitary isles. The great body of them, however, go far north, and are to be met with in the large rivers and lakes near Hudson's Bay, and those of Kamtschatka, Lapland, and Iceland. They are said to return to the latter place, in flocks of about a hundred at a time, in the spring, and also to pour in upon that island from the north, in nearly the same manner, on their way southward in the autumn.

Martin says, that in the month of October, swans arrive in great numbers at Lingey, one of the Western Isles, and continue there till March, when they return northward to breed. A few continue in Mainland, one of the Orkneys, and breed in the little islands of the fresh-water lochs; but the principal part of them retire on the approach of spring. They are called the Countryman's Almanack; for their quitting the isle is said to presage good weather; and their arrival, the reverse.

In Iceland, these birds are an object of chase. In the month of August, they lose their feathers to such a degree as not to be able to fly. The natives, at that season, resort, in great numbers, to the places where they most abound; and are accompanied with dogs, and active and strong horses, trained to the sport, and capable of passing nimbly over the boggy soil and marches. The swans will run as fast as a tolerably fleet horse. The greater number are taken by the dogs, which are taught to seize them by the neck—a mode of attack that causes the birds to lose their balance, and become an easy prey.

This species has several distinctions from that called by us the Tame Swan: but the most remarkable one is the strange form of the windpipe, which falls into the chest, then turns back like a trumpet, and afterwards makes a second bend to join the lungs. By this curious construction, the bird is enabled to utter a loud and shrill note. The other swan, on the contrary, is the most silent of all the feathered tribes. It can do nothing more than hiss, which it does on receiving any provocation. The vocal swan emits its loud notes only when flying, or calling: its sound is, *whoogh, whoogh*, very loud and shrill, but not disagreeable when heard high in the air, and modulated by the winds. The Icelanders compare it to the notes of the violin. As they hear it at the end of their long and gloomy winter, when the return of the swans announces also the return of summer, every note must be melodious which presages a speedy thaw, and a release from their tedious confinement.

It was from this species alone that the ancients derived their fable of the swan's being endowed with the powers of melody. Embracing the Pythagorean doctrine, they made the body of this bird the mansion of the souls of departed poets; and then attributed to the birds the same faculty of harmony which they had thus possessed in a pre-existent state. The common people, not distinguishing

between sweetness of numbers and melody of voice, imagined that to be real which was only intended figuratively. Our own Shakspeare is called the "Swan of Avon." The Mute or Tame Swan never frequents the Padus; "and I am almost equally certain" says Mr. Pennant, "that it never was seen on the Cayster, in Lydia; each of these streams being celebrated by the poets for the great resort of swans. The Padus was styled *Oloriferus*, from the numbers of these birds which frequented its waters; and there are few of the poets, either Greek or Latin, who do not make them its inhabitants."

THE SWAN GOOSE.

This is the *Anas Cynoides* of Linnæus, and is another interesting species of the web-footed family. In point of size, it stands between that of the common duck and the swan; whilst its length is fully a yard. It is known from the goose by its stately carriage, and by its having a large knob at the root of the upper mandible, and a skin almost bare of feathers, hanging down under the throat. A white line extends from the corners of the mouth over the front of the brow. The hue of the bill is orange, and the irides of a reddish brown. A dark brown or black stripe runs down the hinder part of the neck, from the head to the back. The fore part of the neck and the breast are yellowish brown; and the back, and all the upper parts, brownish grey, fringed with a light colour. The legs are orange.

Some writers maintain that these birds were originally natives of Guinea, in Africa. They are now, however, very common everywhere, being widely and numerously dispersed, both in a wild and domestic state. They are found in great numbers about Baikal, an eastern section of Siberia, and likewise in Kamtschatka; and are kept in a state of domestication in most of the Russian provinces.

THE MUTE SWAN.

The plumage of the *Anas Cygnus Mansuetus* of Linnæus, is of a snowy whiteness, and the bird itself is much larger than the wild swan; often weighing twenty-five pounds, and measuring three feet and a-half in length. The female makes her nest among the rough herbage, near the water's edge, and lays from six to eight large white eggs. She sits for the space of six weeks—some say eight—before they are hatched. The young do not acquire their full plumage till the second year.

Swans, from the earliest period of our history, have been protected on the river Thames as royal property; and it continues, at this day, to be accounted felony to steal their eggs. By this means their increase is secured; whilst they prove highly ornamental to the river scenery. In the reign of Edward IV., the estimation in which they were held was such, that no one who possessed a freehold of less than the clear yearly value of five marks, was permitted even to keep them. In those times hardly a piece of water was left unoccupied by these birds, as well on account of the pleasure they gave to the eye of their lordly owners, as that which they afforded when they graced the sumptuous boards at the splendid feasts of that period. The manners of those days, however, have passed away, and swans are not now so common as they were formerly, being by most people considered a coarse kind of food, and consequently held in little estimation; but cygnets (young swans) are still fattened for the table, and are sold for a guinea each, and even more. Hence we may infer that they are better food than is generally imagined.

This swan is a bird beautifully formed. In it we see no broken or harsh lines, no constrained or abrupt motions, but the roundest contour and the easiest transitions imaginable. The eye wanders over every part with pleasure, and each portion takes new grace with new postures.

> "The swan, with arched neck
> Between her white wings mantling, proudly rows
> Her state with oary feet."

It exhibits, however, but an inelegant appearance on land.

The swan will swim faster than a man can walk. It is very strong, and at times extremely fierce; it has not unfrequently been known to throw down and trample upon youths of fifteen or sixteen years of age; and an old swan, we are told, is able to break the leg of a man with a single stroke of its wing. A female, while in the act of sitting, observed a fox swimming towards her from the opposite shore: she instantly darted into the water;

and, having kept him at bay for a considerable time with her wings, at last succeeded in drowning him; after which, in the sight of several persons, she returned in triumph. This circumstance took place at Pensy, in Buckinghamshire.

Swans are very long-lived, sometimes arriving at the age of one hundred years.

WILD GEESE.

Six different species of wild geese are said to visit the British shores in winter. The *grey-lag* is one, and is the original of our common domestic goose. Its flocks are well-known to all country people, from the circumstance of their always flying in a particular figure—that of a wedge. They are difficult to approach in regular hunting form, being shy and wary to a proverb. When they arrive in winter, they frequent the sea-coast, and little rivulets and creeks, feeding on marine and other grasses, and display a great partiality to green wheat. The only mode of getting within range of them is by ambush, or advancing upon them under cover of some kind. Colonel Hawker recommends, that we "ascertain, in the watery meads, what part they have used (which we shall be able to see by their dung and feathers); and then we should wait for them, at dusk, in some ambush that commands the fresh places adjoining. Contrive, if possible, to get the line of a dyke or drain, so as to take their company in the flank." Mr. Daniel likewise says—"Their flight is always (except in thick fogs) very elevated; their motion is smooth, accompanied with little rustling, and the play of the wings seems never to exceed two or three inches; the regularity with which they are marshalled, implies a sort of intelligence superior to that of other birds, which migrate in disorderly bodies. The arrangement observed by the geese, is at once calculated to preserve the ranks entire, to break the resistance of the air, and to lessen the exertion of the squadron. They form two oblique lines, like the letter V; or, if their number be small, only one line. Generally they amount to forty or fifty, and each keeps its rank with admirable exactness. The chief, which occupies the point of the angle, and first cleaves the air, retires, when fatigued, to the rear, and the rest by turns assume the station of the van. Pliny describes the wonderful harmony that prevails in these flights, and remarks that, unlike the cranes and the storks, which journey in the obscurity of the night, the geese are seen pursuing their route in broad day."

The wild goose generally weighs about ten pounds; and is two feet nine inches long, and five broad. The bill is thick at the base, tapers towards the tip, and is of a dullish-red hue, with the nail white. The head and neck are brown, tinged with dull yellow, and, from the separation of the feathers, the latter appears striped downwards. The upper part of the plumage is of a deep brown, mixed with ash-grey. Each feather is lighter on the edges, and the lesser coverts are tipped with white. The shafts of the leading quills are white; the webs grey, and the tips black. The secondaries are black, tinged with white. The breast and belly are crossed and clouded with dusky and ash colours on a whitish ground; the tail and vent are of a snowy whiteness. The middle feathers of the tail are dusky, tipped with white; those adjoining, more deeply tipped; and the exterior ones are nearly all white. The legs are pale red.

During any succession of frosty days, especially if accompanied with a snow-storm, there are few places, on the British coast, which will not afford more or less wild goose shooting. If going on the water, or into the marshes, after these birds, does not suit the convenience or choice of the sportsman, by visiting the brooks and small rivers that are only partially frozen, and following their course, he may be almost certain of meeting with some of these birds. There are many localities in the moor districts of the north of England where they are found in winter, even when it has not been either very cold or stormy.

THE SIBERIAN GOOSE.

The *Anser Ruficollis* of Linnæus, also called the Laughing Goose, is white fronted. It is seldom seen in Britain. Colonel Hawker tells us, that it was unknown here till the frost of 1830, when there were eighty of them alighted in a field near the village of Wilford, where, he says, they were beset by a swarm of gunners, and attacked, but only with very moderate success. The colonel himself succeeded, however, on the following day, in

bringing down twenty. They are described as very hard to kill.

THE CORMORANT.

The three varieties of the *Pelicanus Corbo*, known to sportsmen, are the crested, the black, and the cole-goose. The common cormorant weighs from four to seven pounds; and the size varies from about three feet to four feet six inches in breadth. The bill, to the corners of the mouth, measures four inches, and its ridge two-and-three-quarters. It is of a dark horny consistency, and the tip, or nail, of the upper bill is considerably hooked and sharpened. From the base of this it is furrowed on each side, nearly to the top, without any visible appearance of nostrils. The lower bill is compressed, and covered, about the gape of the mouth, with a naked yellowish skin, extending under the chin and throat, where it hangs loose, and forms a kind of pouch, which, together with the springing blade on each side forming its rim, is capable of great expansion, and by it the bird is enabled to swallow prey apparently too large to be admitted into its throat. The skin about the eye is naked, and of the same colour as the pouch. The eyes, which have a remarkably wild stare, are placed near the bill. The crown of the head and neck are black; and on the hinder part of the former the feathers appear elongated, and form a sort of loose crest. In some species the throat is white, with a kind of stripe passing from it, upwards, behind each eye. In others the cheeks and throat are mixed with brown and white; while, in other species, the head and neck are streaked with scratches of the latter colour. The middle of the belly is white, with a patch of the same colour over each thigh. All the under parts, however, together with the back and rump, are commonly of a glossy blue-black, with green shades. The shoulders, scapulars, and wing-coverts, are of a bronze-brown hue, tinged and glossed with green; and each feather is bordered with shining bluish-black. The secondary quills are nearly of the same colour. The coverts and primaries are dusky. The tail consists of fourteen stiff feathers, which look as if they were discoloured by being dipped in mud or dirty water. The legs are thick, and black, and about two inches and a-half long.

The cormorant is a native of almost every climate. It abounds in large numbers in Greenland and Nova Zembla, and parts adjacent; and the natives have a curious method of taking them, by means of lures or decoys. They make use of the jugular pouch of the bird for a bladder to float their fishing-darts, after they are thrown; whilst their skins, which are tough and leathery, are used for garments, and their flesh for food. It is said, however, that the eggs of the bird are too fœtid even to be eaten by Greenlanders.

These birds usually assemble in flocks, on the summits and inaccessible parts of the rocks which overhang or are surrounded by the sea, upon which the female makes her nest of the withered sea-tang, weeds, sticks, and grasses, which are cast on shore by the waves. She lays four or five greenish-white eggs, of the size of those of a goose, but of a longer shape. Many writers and naturalists assert that, in some parts of the world, these birds build their nests on trees, like the rook and the heron; others, again, forming their opinions from the singular conformation of the feet and the serrated claws, ascribe properties to them which they do not possess, and maintain that they hold their prey in one foot, while, with the other, they push forward to the shore, or carry it thither in the same manner on the wing. This is, however, fancy, unsupported by any evidence of fact. The truth is, the feet of these birds are not adapted for any such purposes. They are, like those of all the expert diving tribes, placed far behind; and while, by their position and the powerful stroke from their broad webs, the birds are able to pursue and overtake their prey, the hooked sharp-edged beak is the only instrument they have fitted both to catch and secure it, and there is no need to use the awkward expedient of removing it afterwards to the foot.

At sea, or in the inland lakes, cormorants prove themselves great gluttons. From the loftiest heights they drop down upon the object of pursuit, dive after it with the rapidity of a dart, and, with an almost unerring certainty, seize it. They then emerge with the fish across the bill, and, with a twirl, throw it up into the air, and dexterously catch it as it descends head foremost, and swallow it whole.

While at rest on shore, these birds sit, more or less, in an erect posture, and are propped up by the stiff feathers of the tail. In places where they have not been disturbed by fire-arms, they have been known, however wary at other times, to sit and receive repeated shots, without offering to move out of the danger. At other times and places, while they sit in a dosing and stupefied state, from the effects of one of their customary surfeits, they may easily be taken, by throwing nets over them, or by putting a noose round their necks, which they endeavour to avoid no further than by slipping the head from side to side as long as they can.

Whatever may be the wild disposition of these birds, we have authentic accounts that certain species of them were formerly tamed, and rendered subservient to the purposes of man, both in this and other countries. Among the Chinese, they have frequently been trained to fish, and fishermen have kept many of them for that purpose, and by their skill have gained a good livelihood. A ring placed round the neck prevents the bird from swallowing what it catches; whilst its natural appetite, joined to the will of its master, induces it instantly to dive at the word of command; but, unable to gorge the fish it has taken, it returns to the keeper, who secures it himself. Sometimes, if the fish be large, and difficult to manage, two will act in concert—one bird taking it by the head, and the other by the tail. Willoughby informs us, that in England, when these birds are brought to the rivers, their hoods are taken off, and then a leather thong is tied round the lower part of their necks, that they may not swallow the fish they take. The birds are then thrown into the water, when they immediately dive; and, for a time, with remarkable swiftness, pursue the fish with great ardour. When they have caught any, they rise to the surface, and pressing them lightly with their bills, swallow them, each to the extent of five or six; then the keepers call them to the fist, to which they readily fly, and little by little, one after the other, vomit up all their finny captures, which appear sometimes a little bruised with the nip the bird has given them with its hooked bill. When the fishermen have done, they set the birds on some high place, and then loose the string from their necks, which leaves the passage free of air to the stomach; and, by way of encouragement, part of the prey is given back again to each bird. Whitlock tells us, likewise, that he had several cormorants manned like hawks, which would come to hand. He took great pleasure in them; and relates, that the best he had was one presented to him by Mr. Wood, master of the cormorants to Charles I.

Dr. Heysham relates, that, on a certain occasion, one of these birds perched upon the castle at Carlisle, and soon afterwards removed to the cathedral, where it was shot at upwards of twenty times, without effect. At length, a person got upon the cathedral, fired at, and killed it. In another instance, a flock of fifteen or twenty perched, at the dusk of evening, on a tree, on the banks of the river Esk, near Netherby, the seat of the late Sir James Graham. A person who saw them settle, fired at random at them, in the dark, six or seven times, without either killing or even frightening any of them away. Surprised at this, he came again at daylight, and succeeded in killing one, when the rest took to flight.

Colonel Hawker says, that cormorants may be seen in the evening, pursuing a regular course towards the cliff, on the sea-coast, where they roost, and that, in their flight, they are often mistaken for Brent geese, and shot at by the inexperienced. They are likewise sought after by adventurous persons, who are able to reach the middle of the rocky heights. In attempting to shoot them in such positions, much caution is requisite in secreting the sportsman from observation. So keen-sighted are these birds, and so jealous of any object that bears even the semblance of a weapon, that they immediately take the alarm at the slightest appearance of an enemy, and thus elude the devices of the best sportsman. Shooting them is considered an excellent exercise for young gunners.

THE WILD DUCK.

The *Anas Bochas* of Linnæus is the parent of our domestic duck, and, in point of size, is a little less. The wild mallard, or drake bird, has a length of about twenty-three inches, and a breadth of about thirty-five. It usually

weighs from thirty-six to forty ounces. The bill is of a yellowish hue; not very flat; about an inch broad, and two-and-a-half long, from the corners of the mouth to the tip of the nail. The head and upper half of the neck are of a glossy, deep, variable green, terminated in the middle of the neck by a white collar, with which it is nearly encircled. The lower portions of the neck, breast, and shoulders, are of a deep vinous chestnut, and the covering scapular feathers are of a kind of silvery white, while those underneath are rufous. Both are prettily crossed with waved threads of brown. The wing-coverts are ash; the quills brown; and between these intervenes what is called the *beauty-spot* in the duck tribe, which crosses the closed wing in a transverse, oblique direction; it is of a rich glossy purple, with violet or green reflections, and fringed by a double streak of white and black. The belly is of a pale grey, delicately pencilled, and crossed with numberless narrow-waved dusky lines, which, on the sides and long feathers that reach over the thighs, are more distinctly marked. The upper and under tail-coverts, the lower part of the back, and the rump, are black; the latter are glossed with green. The four middle tail-feathers are likewise black, with purple reflections, and, like those of the domestic drake, are stiffly curled upwards; the rest are sharp-pointed, and shaded off to the exterior sides, from a brown to a dull white. The legs, toes, and webs are red.

The plumage of the female, which is called a *flapper*, possesses few or none of the beauties of the male, except the spot on his wings. All the other parts are plain brown, marked with black. She makes her nest, lays from ten to sixteen greenish-white eggs, and rears her young generally in the most sequestered mosses or bogs, away from the haunts of man, and hidden from his sight among the reeds and rushes. To her unfledged family (and they are nearly three months old before they can fly) she acts the part of a fond and dutiful parent, carrying or leading them from one pool to another, as her fears and inclinations direct her; and she is known, in this country, to use the same wily stratagems to mislead the sportsman and his dog, as those already noticed respecting the partridge.

Like most of the duck tribes, the mallards, in vast numbers, leave the north at the end of autumn, and, flying southward, arrive in Great Britain in the beginning of winter, and spread themselves over all the lakes and marshy wastes. They pair in the spring, when the greater part of them again return to the north, to breed during the summer months of comparatively warm weather and long days. A few straggling birds remain every season with us, and breed.

It is not at all times that wild duck shooting can be pursued with success. These birds being very shy, considerable art must be employed in endeavouring to bring the shot within range of them. They have fixed times of feeding and visiting certain localities; and the only way for the sportsman to make sure of them, is to watch their movements, and conceal himself from observation. He may thus often intercept their flight when congregated in considerable numbers, and bring down several at a shot. They are sometimes very easily killed, and sometimes not. All depends upon the part of the body which the pellets have struck. Regular wild duck shooters are often very successful in moonlight nights. The birds are then less shy and suspicious.

Wild ducks frequent the marshy places of many parts of this kingdom; but nowhere in greater plenty than in Lincolnshire, where prodigious numbers were wont annually to be taken in the decoys. In only ten decoys in the neighbourhood of Wainfleet, as many as thirty-one thousand two hundred have been caught in one season.

To those who may not know what a decoy is, we may say that it is a pond generally situated in a marsh, so as to be surrounded with wood or reeds, and, if possible, with both, to prevent the birds which frequent it from being disturbed. In this pond the birds sleep during the day; and as soon as the evening sets in, the decoy *rises* (as it is termed), and the wild fowl feed during the night. If the evening is still, the noise of their wings during flight is heard at a great distance, and is a pleasing though somewhat melancholy sound. The *decoy-ducks* (which are either bred in the pond-yard, or in the marshes adjacent, and which, although they fly abroad, regularly return for food to the pond, and mix with the

tame ones that never quit the pond) are fed with hemp-seed, oats, and buck-wheat. In catching the wild birds, hemp-seed is thrown over the screens to allure them forward into the *pipes*, of which there are several, leading up a narrow ditch, that closes at last with a *funnel-net*. Over these *pipes*, which grow narrower from the first entrance, there is a continued arch of netting, suspended on hoops. It is necessary to have a *pipe* for almost every wind that can blow, as on that circumstance it depends which *pipe* the fowl will take to. The decoy-man likewise always keeps to the leeward of the wild fowl; and burns, in his mouth or hand, a piece of *Dutch turf*, that his own smell, if he have any, may not reach them; for, if they once discover by their scent that a man is near, they all instantly take flight. Along each *pipe* are placed *reed screens*, at certain intervals, to prevent him from being seen till he thinks proper to show himself, or the birds have passed up the *pipe*, to which they are led by the trained ducks, which know the decoy-man's whistle, or are enticed by the hemp-seed. A dog, which is taught to play backwards and forwards between the screens, at the direction of his master, is sometimes used. The fowl, roused by this new object, advance towards it, while the dog is playing still nearer to the entrance of the *pipes*. At last the decoy-man appears from behind the screens, and the wild fowl, not daring to pass by him, and unable to fly off on account of the net covering the hoops, press forward to the end of the funnel-net, which terminates upon the land, where a person is stationed ready to take them. The trained birds return past the decoy-man into the pond again, till a repetition of their services is required. The general season for catching is from the latter end of October till February.

It was formerly customary to have, in the fens, an annual *driving* of the young ducks, before they took wing. Numbers of people assembled, who beat a vast tract, and forced the birds into a net placed at the spot where the sport was to terminate. By this practice —which, however, has been abolished—as many as a hundred and seventy-four dozen have been known to be taken in one day.

Wild ducks do not always build their nests close to the water, but often at considerable distance from it; in which case the female will take the young in her beak, or between the legs, to the water. They have been known sometimes to lay their eggs in a high tree, in a deserted magpie's or crow's nest; and an instance has likewise been recorded of one being found at Etchingham, in Sussex, sitting upon nine eggs, in an oak, at the height of twenty-five feet from the ground. The eggs were supported by some small twigs laid crossways.

We are informed, that at Bold, in Lancashire, there were formerly great numbers of wild ducks, during the summer-time, in the ponds and moat near the hall. These, it is said, used regularly to be fed. A man beat with a stone on a hollow wooden vessel, and immediately the ducks would come round him. He scattered corn among them, which they gathered with as much quietness and familiarity as might be expected from tame ducks. As soon as they had finished their repast, they returned to their accustomed haunts.

Prodigious numbers of these birds are taken by decoys, in Picardy, in France. It is customary there, to wait for the flock's passing over certain known places; when the sportsman, having a wicker cage, containing a quantity of tame birds, lets out one at a time, which enticing the passengers within gun-shot, five or six are often killed at once by an expert marksman. They are also, now and then, taken by hooks baited with raw meat, which the birds swallow while swimming on the water.

Other methods of catching ducks and geese are peculiar to certain nations. One of these, from its singularity, seems worth mentioning. A person wades into the water up to the chin; and, having his head covered with an empty *calabash*, or gourd, approaches the place where are the ducks; which, not regarding an object of this kind, suffer him freely to mix with them. He then has only to pull them by the legs under the water, one after another, and fix them to his belt, till he is satisfied; returning as unsuspected by the remainder as when he first went among them. This curious method is frequently practised on the river Ganges, the earthen vessels of the Hindoos being used instead of calabashes. These vessels are what the Hindoos boil their rice in. After having been once used, these vessels are looked upon as defiled, and are thrown

into the river as useless. The duck-takers find them convenient for their purpose, as the ducks, from seeing them constantly floating down the stream, esteem them as objects not to be regarded.

The Chinese make great use of ducks, but prefer tame to wild ones. It is said that the greater number of the ducks in China are hatched by artificial means. The eggs, being laid in boxes of sand, are placed on a brick hearth, to which is given a proper heat during the time required for hatching. The ducklings are fed with craw-fish and crabs, boiled and cut small, and afterwards mixed with boiled rice; and, in about a fortnight, they are able to shift for themselves. The Chinese then provide them an old *step-mother*, who leads them where they are to find provender; being first put on board a *sampane** or boat, which is destined for their habitation; and from which the whole flock, often to the amount of three or four hundred, go out to feed, and return at command. This method is used nine months out of the twelve; for in the colder months it does not succeed, and is so far from a novelty, that it may be everywhere seen; but more especially about the time of cutting the rice, and gleaning the crop, when the masters of the duck-sampanes row up and down the river, according to the opportunity of procuring food, which is found in plenty, at the tide of ebb, on the rice plantations, as they are overflowed at high water. It is curious to observe how the ducks obey their masters; for some thousands, belonging to different boats, will feed at large on the same spot, and, on a signal given, will follow their leader to their respective sampanes, without a single stranger being found among them. This is still more extraordinary, if we consider the number of inhabited sampanes on the Tigris, which have been supposed to be not less than 40,000, moored in rows, close to each other, with, here and there, a narrow passage left for boats to sail up and down the river. The Tigris, at Canton, is somewhat wider than the Thames at London; and the whole river is there covered in this manner for upwards of a mile.

* Sampanes is a common name for boats: the inhabited ones contain each a separate family, of which they are the only dwelling; and many of the Chinese pass almost their whole lives in this manner on the water.

In Cambridgeshire, Lincolnshire, Martin Mere; in Lancashire, in North and South Wales, in Scotland, in the Fern Islands, off Bambro' Castle, and in Northumberland, there are countless thousands of these birds to be met with in the winter season. By a recent act of parliament, no wild fowl, either young or old, can be legally killed from the last day of March to the 1st of October.

THE POCHARD, OR DUN-BIRD.

Of the *Anas Ferina* of Linnæus, Mr. Daniel gives us the best account:—"It is about the size of a widgeon, and weighs one pound twelve ounces. Its length is nineteen inches; breadth two feet and a-half; the bill is broader than the widgeon's, of a deep lead colour, with a black tip; irides orange; the head and neck orange chestnut, with a small triangular spot of white under the centre of the lower mandible; the lower parts of the neck and breast, and upper part of the back, dusky black; scapulars and wing-coverts, nearest the body, of a grey white, elegantly marked with narrow lines of black; the exterior wing-coverts and quills dusky brown; secondary quill-feathers regularly edged with a stripe of white; the belly ash-coloured and brown; vent-feathers and coverts of tail black; the tail consists of twelve short feathers, of a deep grey; the legs lead-coloured. The female has the head of a pale reddish brown; the breast is rather of a deeper colour; wing-coverts and belly cinereous; and the back marked like that of the male. These birds are eagerly bought by the London poulterers under the name of dun-birds, as they are deemed excellent eating. The greater part of what appear in the markets are caught in decoys; but the construction and mode of working are perfectly distinct from that wherein the other wild fowl are taken. A decoy for dun-birds is called a flight-pond, and has nets fastened to tall stout poles, twenty-eight or thirty feet long; at the bottom of each pole is fixed a box, filled with heavy stones, sufficient to elevate the poles and nets the instant an iron pin is withdrawn, which retains the nets and poles flat upon the reeds, small willow boughs, or furze. In the inside of the nets are small pens, made of reeds, about three feet high, for the reception of the birds that strike against the nets and fall down; and

such is the form and shortness of the wing of pochards, that they cannot ascend again from these little inclosures if they would; besides, the numbers which are usually knocked into these pens, preclude all chance of escape from them by the wing. A decoy-man will sometimes allow the haunt of dun-birds to be so great, that the whole surface of the pond will be covered with them previous to his attempting to take one. Upon such occasions he bespeaks all the assistance he can get, to complete the slaughter by breaking their necks. When all is ready, the dun-birds are roused from the pond; and as all wild fowl rise against the wind, the poles in that quarter are unpinned, and fly up with the nets at the instant the dun-birds begin to leave the surface of the water, so as to meet them in their first ascent; and they are thus beat down by hundreds. At the pond of Mr. Baxton, at Goldhanger in Essex, as many pochards have been taken at one *drop* as filled a waggon, so full as to require four stout horses to carry them away; and the lower birds in the pens have been known to be killed and pressed entirely flat, from the numbers of their companions heaped up above them by the fatal stoppage of the poles and nets. The few attempts made to domesticate the pochard have been hitherto unsuccessful. They do tolerably well where there is plenty of water, but cannot bear walking about on hard, pebbly grounds."

The pochard leaves the northern regions at the commencement of winter, and directs its course southward. It is said that it frequents Egypt, also the entire section of the Holy Land; and is very numerous in some of the lakes and marshy districts in America, especially in Carolina and Louisiana. In France it makes its appearance about the month of October, in large flocks; and about the same period it may be found in all the low and fenny districts of Great Britain.

In shooting this bird, especially in a severe snow-storm, accompanied with a hard frost, it is found not to be so difficult to bring to the ground with tolerably sized shot as some other wild fowl; it is, however, always a matter of difficulty to get within range of it, for it is very shy, and remarkably quick in recognising an enemy, when it immediately takes wing to some safe retreat.

THE WIDGEON.

This well-known bird is the *Anas Penelope* of Linnæus, and has a length of about twenty inches, a breadth of from two to three feet, and a weight of about twenty-two ounces. The bill is an inch and a-half long, and narrow, with its outer edges serrated. The upper mandible is of a dark leaden hue, tipped with black. The crown of the head is very high and narrow, and is of a cream colour, with a small spot of yellowish white under each eye. The rest of the head, the neck, and the breast, are of a bright rufous chestnut, faintly freckled on the head with black spots, and darkest on the chin and throat, and tinged with a vinous colour. A band, composed of beautifully waved or indented narrow ash-brown and white lines, separates the breast and neck. The scapulars and back are marked with similar feathers, as are also the sides of the body under the wings, even as low as the thighs. These, however, are paler. The belly, to the vent, is white, and the ridge of the wing and adjoining coverts are of a dusky ash-colour, approaching to brown. The great coverts are brown, fringed with white, and tipped with black, which forms a border to the changeable green *beauty-spots* of the wings, which are likewise bordered on the under side by the deep velvet black tips of the secondary quills. The exterior webs of the adjoining quills are white; and those next the back, which are very long, are of a deep brown, fringed with yellowish white. The greater quills are brown; the vent and upper tail-coverts are black.

During the night, whilst widgeons are taking their course through the air, they may be distinguished from other wild fowl by the peculiar whistling note they use. They have been domesticated, and are generally much admired on account of their liveliness and beauty.

On the approach of frosty weather, they leave the desolate regions of the north, and direct their course to the south, breaking into detached and diverging lines, and spreading themselves along the shores, and over the morasses and lakes of different countries. Large numbers of them are found in the East, particularly in Egypt, and in the islands of the Mediterranean. They remain in these

parts during the winter, at the end of which the old birds pair; and the whole flock, in full plumage, take their departure northward about the end of March. While the widgeon remains in Britain, it frequents the same places, and feeds in the same mode as the mallard, and is often taken in the decoys, along with different species of the duck tribe.

There are a great number of birds called *divers;* and among the number are the scoter, scaup, golden-eye, and morillon. Colonel Hawker says there are *seven* kinds of these divers to be found in Great Britain, exclusively of other six, which are separately classed as the genus *Mergus*. Mr. Daniel observes, that "they vary much both in plumage and size; some weighing two pounds and a-half, and others a pound less, and are caught in the decoys with the ducks. In hard weather, they frequent the shores and tide rivers in great plenty, and are almost always, at that season, fat and in good condition. They do not fly in such large flocks as many of the duck species, but usually close to the surface of the water, and bear very hard blows from the shot without dropping, unless struck upon the head or wing. The scoter is seen in prodigious numbers, from November to March, on the French coasts, especially if the wind be to the north, or north-west. The day seems to be spent by these birds between diving and flying to small distances over the water, which they do so low as often to dip their legs in it. They swallow their food whole, and soon digest the shells, which are found crumbled to powder among their excrements. They have been kept tame for some time, and will feed on soaked bread. The flesh tastes fishy in the extreme; and, from this cause, is allowed by the Roman Catholics to be eaten on fast days and in Lent; and, indeed, to say the truth, must be a sufficient mortification."

However amusing the shooting of these birds may be, it is not attended with much profit, as they are very difficult to hit. They are wonderfully quick in diving; for the moment the gun is pointed, down they go. In stormy weather—that is, with the wind from the north-east, cold and frosty—a sportsman on the east coast of Britain, may now and then waylay these birds on their flights, and succeed in bagging a few brace; but even to do this, great exertion, patience, and the concurrence of favourable circumstances, are required.

THE TEAL.

The *Anas Crecca* of Linnæus is a great favourite with many sportsmen, and is considered both a beautiful and handsome bird. It is about twelve ounces in weight, fifteen inches in length, and twenty-four in breadth. The bill is dark, tipped with white. The irides are pale; and a glossy bottle-green patch, fringed on the upper side with pale brown, and beneath with cream-coloured white, covers each eye, and extends to the nape of the neck. The rest of the head, and the upper part of the neck, are of a deep reddish chestnut, darkest on the forehead, and freckled on the chin and about the eyes with cream-coloured spots. The hinder part of the neck, the shoulders, part of the scapulars, sides under the wings, and lower belly towards the vent, are pencilled with black, ash-brown, and white traversed waved lines. The breast is of a pale brown or reddish yellow, and each feather is tipped with a roundish heart-shaped black spot, having a resemblance to the markings of the Indian shell. The belly is a cream-coloured white. The quills, lesser and greater coverts, are brown, and the last are deeply tipped with white, which form a bar across the wings. The first six of the secondary quills are of a fine velvet black; while those next to them, towards the scapulars, are resplendent glossy green; and both are tipped with white, forming the divided black and green bar, or *beauty-spot* of the wings.

The tail consists of fourteen feathers, of a whitish brown colour, with pale edges; and the legs and feet are of a dingy lead. The female, which is less than the male, has its head and neck prettily freckled with brown and white. She has not the green patch between the eyes, but a brown streak supplies its place, and extends to the nape of the neck. The crown of the head is dark brown. The upper mandible yellow on the edges, olive green on the sides, and olive brown on the ridge. The nail is black, and the under bill yellow. The breast and belly are of a glossy yellowish white, irregularly spotted with brown. The upper plumage is dark brown, each feather being bordered with rusty brown, and fringed with grey. The wings are like those of the male bird.

In most parts of Great Britain, during winter, teal are common; but it is not very well ascertained whether they remain throughout the year to breed, as they do in France. The female makes a large nest, composed of soft dried grasses, lined with feathers, concealed in a hole among the roots of weeds and bulrushes, near the edge of the water; and some naturalists have asserted, that the nests, in several instances, have been found entirely to float on the surface of the water, so as to rise and fall with it. The eggs are of the size of those of a pigeon, and amount to six or seven in number. They are of a dull white colour, freckled with small brownish spots. Their numbers vary. Some have been known to lay twelve eggs. Buffon says, that numbers of young teal are seen in pools, feeding on cresses, wild chervil, &c.; and, unquestionably, as they grow up, they feed, like other ducks, on the various seeds, grasses, and water-plants, as well as on the smaller living things with which all stagnant waters are so abundantly stored. The bird is highly extolled for the excellence of its flavour.

Teal are seldom found in large numbers; scarcely ever more than ten or twenty are seen together, and this only in stormy weather, and in certain favourite localities near the coast, or by the edges of a sheet of water, where they are fringed with long grass, or brushwood. They are comparatively solitary birds, confining themselves chiefly to families; and it is only in this way that they are interesting to the sportsman. A man may range a considerable section of marshy country, and not see more than a pair or two at a time. In all the moor and boggy districts, in the north of England, they are to be met with; but never in great numbers.

There is a large portion of wild-fowl shooting pursued as a matter of business and traffic, and, consequently, with a view to filling the coffer rather than furnishing sport. This is chiefly confined to the low districts of the coast, where birds of the duck kind, especially, congregate in immense flocks at certain seasons of the year. Many persons gain a good livelihood by this kind of shooting as it is followed on the Hampshire coast, and the Isle of Wight. The coast between these localities consists, at ebb tide, of vast muddy flats, covered with green sea-weed; and affords the fowler an opportunity of practising arts perhaps not elsewhere resorted to. Fowling and fishing are, indeed, on this coast, commonly the employments of the same person. He who in summer, with his line or net, plies the shores when they are overflowed by the tide, in winter with his gun, as evening draws on, runs up in his boat among the little creeks, which the tide leaves in the midlands, and lies in patient expectation of his prey. Sea-fowl usually feed by night, when, in all their multitudes, they come down to graze on the savannahs of the shore. As the sonorous cloud advances (for their noise resembles a pack of hounds in the air in full cry), the attentive fowler listens which way they bend their course: perhaps he has the mortification to hear them alight at too great a distance for his gun (though of the longest barrel) to reach them; and if he cannot edge his boat round some creek, which it is not always in his power to do, he despairs of success that night; perhaps, however, he is more fortunate, and has the satisfaction to hear the airy noise approach nearer, till at length the host settle on some plain upon the edge of which his boat is moored. He now, as silently as possible, primes both his pieces anew (for he is generally doubly armed), and listens with all his attention. It is so dark, he can take no aim; for, if he could discern the birds, they would also see him, and, being extremely timorous, would seek some other pasture. Though they march with noise, they feed in silence; some indistinct noises, however, if the night be still, issue from so vast a concourse. He directs his piece, therefore, towards the sound, fires at a venture, and instantly catching up his other gun, discharges it where he supposes the flock to rise on the wing. His gains, for the night, are now decided, and he has only to gather his harvest. He immediately puts on his mud-pattens (flat, square pieces of board, which the fowler ties to his feet that he may not sink in the ooze), ignorant yet of his success, and goes groping about in the dark in quest of his booty, picking up sometimes many, and perhaps not one; so hardly does the poor fowler earn five shillings, exposed in an open boat, during a solitary winter night, to the weather as it comes—rain, hail, or snow, on a bleak coast—a league

probably from the beach, and often liable, without great care, to be fixed in the mud, where he would become an inevitable prey to the returning tide. We have heard of a poor fellow who never took a dog with him in these expeditions, because no dog could bear the cold which he was obliged to suffer. The tide often throws, next day, on different parts of the shore, many of the birds which he had killed on the previous night, but could not find them.

This is the account given by Mr. Gepin, of this kind of sport; but, since his time, the mode of pursuit has been greatly improved.

The danger, Mr. Daniel tells us, of fowlers attacking the wild fowl in small boats, arises from the circumstance, that when there happens to be ice in the river, they get encircled by it, and can only hope to extricate themselves by following the current, wherever it may take them. It not unfrequently happens that the men are detained two or three tides, before they can work their way out of the icy entanglement. They also suffer much, in such cases, from cold and privation.

On and in the vicinity of the Fern Islands, near to Berwick-upon-Tweed, wild fowl congregate, and breed in surprising numbers. It is impossible, in walking on the ground, to step upon a single square foot of space without crushing eggs beneath your feet. In the winter season, when there is a storm from the east or north-east, with a heavy sea breaking on the shore, the wild fowl may be shot, even on the mainland, in considerable quantities, by artfully concealing oneself along the beach. Storms have sometimes so bewildering an effect, even on these hardy birds, that they seem quite stupid, and will sometimes come within twenty yards of the gun, in daylight.

LAKE AND POND SHOOTING.

This sport can only be followed in certain parts of the kingdom, as, where there are neither lakes nor ponds, it cannot be pursued. In the fenny districts of Lincolnshire and Cambridgeshire, however, where the various kind of wild ducks breed among the reeds and long grass in the boggy grounds, this sport is to be obtained. Here the young are hatched, and, in the month of August, receive the name of *flappers;* and the shooting of them then commences, and is found to be excellent sport. This kind of shooting is altogether different from that which is practised on the coast, where the birds only come to feed at particular seasons, and where they never breed. These fens, meres, or broads, are sometimes amazingly stocked with birds of all kinds; and great numbers are shot, or taken in traps and nets for the London market.

For Hampshire coast-punt shooting, a gun of *fifty pounds' weight* is that which is found to be the most suitable. The old heavy pieces of seventy and eighty pounds, rendered the punt immovable when fouled on grass and winkles, which are shells strewed over the oozes in countless myriads. The sportsman, in such a punt, rows with his back to the gun, until he sees the fowl, when he turns on his face, and works himself along with a kind of prong, weighted to catch the ground. When the water is too deep for the pushing-pole readily to reach the ground, two paddles are made use of to help the fowler forward. Having given these general instructions, the reader is referred to the work of Colonel Hawker for further information. There he will find all that relates to mud-pattens, mud-boards, and to several modifications of the launching-punt, the launching-sledge, the Sussex mud-boat, and the Poole canoe—all devices and instruments made to facilitate the capture of the wild fowl in the creeks and oozes of this part of the British coast.

There are other matters connected with this sport sufficiently important to demand a slight notice, amongst which is the dress of the wild-fowl sportsman. Respecting this, Mr. Daniel says—"To be properly equipped for this sport in *severe* weather, it is essentially requisite to be well clothed. Flannel shirt, drawers, and additional exterior and warm garments, will not be found unpleasant to those who face the cold winds upon the marshes, or sit fixed in a punt alongside the oozes; thick yarn stockings, and, over them, what are termed wads by the fisherman (knit woollen stockings that come up to the middle; and, however inelegant in their appearance, prove very solid comforts to the wearer); and over these double defenders of the legs, a pair of waterproof boots will also be found indispensable. A cap must be worn, made of skin, instead of a hat; as the wild fowl will not approach near the latter."

Wild-fowl shooting being a severe and much-exposed amusement, ought not to be engaged in by young men of a consumptive habit. Indeed, we have heard of many a man possessed of what is called an *iron constitution*, sinking under long-continued exposure to night air, want of sleep, with, perhaps, a too great indulgence in tippling, to *keep the cold out*. The best means for this is to go out to the sea-shore in a frosty night, pretty well soaked with *warm tea;* it will enable the sportsman to stand longer uninjured by cold and damp than anything he can take. We have found this to be true from personal experience, as well as from the testimony of others.

Wild-fowl shooting can be obtained in almost every section of the coast of Great Britain and Ireland, and in most of the mountainous and moorish districts of both islands. North and South Wales present some fine lakes for this kind of shooting; and so likewise do all the Highland localities of Scotland. The whole coast of this part of Britain offers a large field for this sport; and to one who wishes to enter zealously into it, we would recommend him to take a tour round the western isles, by the north cape, returning by the eastern side of the island. In such an excursion he will find sport enough to satisfy the most ravenous appetite.

In India, wild-fowl shooting is zealously followed, both by British residents and natives. "The English," says Mr. Pennant, "send out their servants as well as Indians to shoot these wild fowl on their passage. It is in vain to follow them; they therefore form a row of huts made of boughs, at musket-shot distance from each other, and place them in a line across the parts of the west marshes of the country where the fowl are expected to pass. Each stand is occupied by a single person; these, on the approach of the birds, mimic their *cackle* so well, that they will answer, wheel, and come near the hovel. The sportsman keeps motionless, and on his knees, with his gun cocked, and never fires till he has seen the eyes of the wild fowl. He fires as they are going from him; then picks up another gun that lies by him, and discharges that. The fowl killed he sets up on sticks, as if alive, to decoy others; he also makes artificial birds for the same purpose. In a good day (for they fly in very uncertain and unequal numbers), a single Indian will kill two hundred. Notwithstanding every kind of wild fowl has a different call, yet the Indians are admirable in their imitation of every one."

There is a kind of shooting called *flight-shooting*, which is thus spoken of by Mr. Blaine. —"The uninitiated in this sport," he says, "without other company than one friend or his servant, may commence with this shooting by following these instructions:—By either a punt or canoe, provided you can pitch on a retired spot, not followed up either by the fishermen or the rabble of the neighbourhood. In a canoe, either by rowing or pushing yourselves along between the banks of a creek, being well screened from observation, your chance of success is in the proportion of your prudence in keeping yourselves completely concealed, and in the dexterity of your manipulations, when the fowl begin to arrive in small tribes towards nightfall. Being provided each with a handy duck gun, wait their arrival patiently. Now, as Colonel Hawker most descriptively expresses it, you will probably soon hear the whistle of the approaching widgeon, the stormy rush of the dun-birds, the plaintive notes of the plover, and the shrill sound of the approach of the wild ducks. It will offer you more chance of success should the weather be somewhat boisterous, and still more, if the birds are forced to fly against the wind, which not only makes them fly low, but pretty closely together also. Be particularly careful that nothing you have on can make a glare; be as still as death, yet watchful as life can make you; and as the birds, in the flight up the creek, lower themselves, shoot well forwards—say one or two feet, before their heads, according to the rate at which they fly. If you can find or even make any screen, one may leave the boat, and wait the flight of a tribe coming on the marsh to feed; the other may wait his own chance with patience in the boat. This shooting may also be attempted, and often successfully, when alone, and likewise without a boat, provided you have the means of concealing yourself, which will, in all probability, happen, by taking advantage of some of the deep indentations made by storms, currents, or under the banks of a brook. Wait patiently in such a situation, and you will be almost

certain of success, particularly about the dusk of the evening; and, if you are as great a zealot as we have been at the sport, try the grey of the morning, which we have commonly found the best time, because the best employed for this purpose."

CHAPTER XIII.

ROOK SHOOTING.

Rook shooting is excellent sport, and is followed in the month of May. The rook is about the size of the carrion crow, and is very like it, except in its glossy plumage. The base of the bill and nostrils, as far as the eyes, is covered with a white skin, which constitutes one of the points of difference between it and the common carrion crow. It is gregarious, and collects in vast multitudes at morning and evening, to repair and return to its feeding and resting-place. During the breeding-time rooks live together in large societies, and build their nests on trees close to each other, and, not unfrequently, even in the heart of populous cities, says Mr. Hone, in his *Every-Day Book*.

Besides insects, rooks feed on different kinds of grain, and cause some inconvenience to the farmer; but to whatever extent this may be, it seems greatly repaid by the good they do to him, in extirpating the maggots of some of the most destructive of the beetle tribe. In Suffolk, and in some parts of Norfolk, the farmers find it beneficial to encourage the breed of rooks, as the only means of freeing their ground from the grub which produces the cock-chafer, which, in this state, destroys the roots of corn and grass to such a degree, that there are some pieces of pasture-land where you might turn up the turf with your foot.

These birds are sometimes seen in flocks so great as to darken the air in their flight. They build their nests on high trees, close to each other; generally selecting a large clump of the tallest for this purpose. When once settled, they, every year, frequent the same place. They are, however, bad neighbours to each other; for they are continually fighting and pulling to pieces each other's nests. These proceedings seem unfavourable to their living in such close community; and yet, if a pair offer to build on a separate tree, the nest is plundered and demolished at once. Some unhappy couples are not permitted to finish their nests until the rest have all completed their buildings; for, as soon as they get a few sticks together, a party comes and demolishes the whole. It generally happens that one of the pair is stationed to keep guard, while the other goes abroad for materials. From their conduct in these particulars, our cant-word *rooking*, for cheating, originated.

As soon as the rooks have finished their nests, and before they lay, the cocks begin to feed the hens, who receive their bounty with a fondling tremulous voice, fluttering wings, and all the little blandishments that are expressed by the young while in a helpless state. This gallant deportment of the males is continued throughout the whole season of incubation.

There seems to exist a wonderful antipathy between these birds and the raven. It is said, that as soon as a raven builds her nest in a tree adjoining a rookery, all the rooks immediately forsake the spot. At a rookery at Broomham, near Hastings, upon a raven building her nest in one of the trees, all the rooks forsook the spot; they, however, returned to their haunts in the autumn, and built their nests there the succeeding year. It is not difficult to account for this antipathy. The raven will scarcely suffer any bird whatever to come within a quarter of a mile of its own nest, being very fierce in defending it. Besides, it seizes the young rooks from their nests, to feed its own young.

Rooks begin to build in March; and, after the breeding season is over, forsake their nesting trees, and, for some time, roost elsewhere; but they have always been observed to return in August. In October, they repair their nests. When the first brood of rooks are sufficiently fledged, they all leave their nest-trees in the day-time, and resort to some distant place in search of food: but return regularly every evening, in vast flights, to their domiciles; where, after flying round several times with much noise and clamour, till they are all assembled together, they take up their abode for the night.

In parts of Hampshire, adjacent to the New Forest, after the rook has reared its progeny, and has carried off such of them as have escaped the arts of men and boys, it retires every evening, at a late hour, during the autumn and winter months, to the closest coverts of the forest, having spent the day in the open fields and enclosures in quest of food. Its late retreat to the forest is characteristic of the near approach of night.

"Retiring from the downs, where all day long
They pick their scanty fare, a black'ning train
Of loitering rooks thick urge their weary flight,
And seek the shelter of the grove."

But although the forest may be called its winter habitation, it generally, every day, visits its nursery; preserving the idea of a family, which it begins to make provision for very early in the spring.

Dr. Darwin has remarked, that a consciousness of danger from mankind is much more apparent in rooks than in most other birds. Any one who has in the least attended to them, will see that they evidently distinguish that the danger is greater when a man is armed with a gun, than when he has no weapon in his hands. In the spring of the year, if a person happen to walk under a rookery with a gun in his hand, these inhabitants of the trees rise on their wings, and call to the unfledged young to shrink into their nests from the sight of the enemy. The country-people, observing this circumstance so uniformly to occur, assert that rooks can smell gunpowder.

In England these birds remain during the whole year; but both in France and Silesia they migrate. It is said that there are no rooks in the island of Jersey, although they frequently fly over from Britain into France. The young birds, when skinned and made into pies, are much esteemed by some persons; they are, however, very coarse meat, and far from being universally relished.

CHAPTER XIV.

THE PIGEON.

Pigeons form a tribe which are considered to be the connecting link between the passerine birds and the poultry. They are much dispersed over the world, some of the species being found even in the arctic regions. Their principal food is grain: they drink much—not, however, at intervals, like other birds, but by a continued draught, like quadrupeds. During the breeding-time they associate in pairs, and pay court to each other with their bills. The female lays two eggs, and the young which are produced, are, for the most part, a male and a female. They usually breed more than once in the year; and the parent birds divide the labour of incubation by sitting alternately on the eggs.

Both the male and female assist in feeding their young. This, in most of the species with which we are acquainted, is done by means of a substance in appearance not unlike curd, and analogous to milk in quadrupeds, that is secreted in their crop. During incubation, the coats of the crop are gradually enlarged and thickened, like what happens to the udders of

female quadrupeds during the time of uterine gestation. On comparing the state of the crop when the bird is not sitting, with its appearance on these occasions, the difference is found to be very remarkable. In the first case it is thin and membranous; but when the young are about to be hatched, it becomes thicker, and takes a glandular appearance, having its internal surface very irregular. Whatever may be the consistence of this substance when just secreted, it probably very soon coagulates into a granulated white curd; and in this form it is always found in the crop. If an old pigeon be killed just when the young ones are hatching, the crop will be found as above described, having in its cavity pieces of white curd mixed with the common food of the bird, such as barley, peas, &c. The young pigeons are fed for a little while with this substance only; about the third day some of the common food is to be found along with it. As the pigeon grows older, the proportion of common food is increased; so that by the time it is seven, eight, or nine days old, the secretion of the curd ceases in the old ones, and of course no more is found in the crop of the young. It is a curious fact, that the parent pigeon has, at first, power to throw up this curd without any mixture of common food; although afterwards both are thrown up in the proportion required for the young.*

THE STOCK-DOVE.

This is the *Columba Ænas* of Linnæus; and, from being the parent stock whence all the varieties of the domestic pigeon are derived, is often called the stock-dove. It is still found in many parts of our island in a wild state; forming its nest in holes of rocks, and old towers, and in the hollows of trees; but never, like the ring-dove, on the boughs.

There is considerable uncertainty about the identity of this bird. Bewick calls it the *wild pigeon;* and Colonel Montague the *rock-dove,* or *rockier;* and he says that ornithologists seem to differ concerning the rock and the stock-pigeon, though it appears almost impossible to conceive them a distinct species. Bewick says, that the stock-dove, rock-pigeon, and wood-pigeon, with some small differences, may be included under the same denomination. The wood-pigeon ought to be taken entirely out of this class, because it is well known never to produce any sexual intercourse with the domestic pigeon, though every effort has been tried which ingenuity could suggest. The stock-dove is very generally diffused throughout all the countries in Europe. It is said to be migratory; but this is not well ascertained. The nest of the female is very loosely and rudely put together; so much so, that the eggs can be distinctly seen from the under part of the nest. She lays two white eggs. These birds live on wild fruits, herbs, and on all kinds of grain. They are very partial to peas, and are themselves delicate eating, except when they have been for some time feeding on turnips; they then acquire a strong and rancid flavour. In habit they are shy, but are somewhat more easily killed with shot than the common wood-pigeon. When they assemble in large flocks, they set scouts to watch; but, by a little care, and keeping perfectly still, if possible, the sportsman may succeed in getting at them. Some writers say they are more common in the southern counties of England than in the northern. They are likewise numerous in some districts of Wales. In some of the continental states, particularly in Hungary, Bohemia, and Servia, they appear in great flocks, at certain seasons of the year, and are shot in large numbers by the sportsmen and peasants of these countries.

Multitudes of wild pigeons visit us in the winter, from their more northerly summer retreats; appearing about November, and again retiring (except a few that breed with us) in the spring. While the beech woods were suffered to cover large tracts of ground, these birds used to haunt them in myriads, frequently extending above a mile in length, as they went out in the morning to feed. In a state of domestication, these pigeons are rendered of very material service. They frequently breed eight or nine times in a year; and though only two eggs are laid at a time, their increase is so rapid and prodigious, that, at the expiration of four years, the produce and descendants of a single pair may amount to the immense number of nearly fifteen thousand.

* What is here termed curd, is not literally such, but is so called from its much resembling that substance in appearance.

The usual way of enticing pigeons to remain at a required spot, is to place what is called a *salt-cat* near them. This is composed of loam, old rubbish, and salt, and will so effectually answer the purpose as to decoy even those belonging to other places; it is on this account held illegal. There are a great many varieties of the domestic pigeon; and of these the *carriers* are the most justly celebrated. They obtain their name from the circumstance of their conveying letters and small packets from one place to another. It is through attachment to their native place, and particularly to the spot where they have brought up their young, that they are thus rendered useful to mankind. The bird is conveyed from its home to the place whence the information is intended to be sent, and the letter is tied under its wing, when it is let loose. From the instant of its liberation, its flight is directed through the clouds, at an amazing height, to its home. By an instinct altogether inconceivable, it darts onward in a straight line to the very spot whence it was taken; but how it can direct its flight so exactly, will probably for ever remain unknown to us. The carrier-pigeon is easily distinguished from the other varieties, by a broad circle of naked white skin round the eyes, and by its dark-blue or blackish colour.

THE RING-DOVE.

This is the largest of all the British pigeons, generally weighing about twenty ounces; and may at once be distinguished by its size from all the rest. It builds on the branches of trees, generally preferring those of the pine; the nest is large and open, formed principally of dried sticks; and the eggs, which may be frequently seen through the bottom of the nest, are larger than those of the domestic pigeon. Attempts have frequently been made to domesticate this bird, by hatching its eggs in dove-houses under the common pigeon; but as soon as the young ones were able to fly, they always escaped to their proper haunts.

Some writers think the wood-pigeon (for it often goes by this name) has considerably decreased within late years; but this is, at least, doubtful. When Mr. White, of Selborne, wrote his admirable *History*, we believe the birds were pretty numerous; and our belief is that they are as numerous now (if not more so) as at any previous period. It is impossible to travel in any direction in Great Britain and not see vast flocks of them, at least on those tracts of country which abound with a fair portion of wood, and are in a state of tolerable cultivation. Mr. White says, on this point, that "he had often killed near twenty in a day; and that on some occasions, with a long fowling-piece, he has even shot seven or eight at a time on the wing, as they came wheeling over his head; and that there were often, among them, little parties of small blue doves, which are called rockiers."

In shooting the wild pigeon, it requires rather a heavy blow to knock it down. Its feathers are close, and resist shot like those of water-fowl. When these birds collect in considerable numbers about turnip-fields in winter, they invariably set pickets to watch over a surprise. These sit on two or three of the highest trees in the neighbourhood; and when they give the alarm, the entire body immediately take flight. We have been often struck, and sometimes a little mortified into the bargain, to see how adroitly and cleverly these sentinels perform their duty. Yet in spite of their instinctive and systematic vigilance, the sportsman may often succeed in getting within range of the flock, and do considerable execution, by having a reliable gun, and using rather large-sized shot. In the months of July and August, this bird visits old pasture-fields, and feeds rather keenly on the seeds of a species of grass which is then abundant. We give this hint to the sportsman that he may profit by it, if it suit his inclination.

About the beginning of winter, ring-doves assemble in great flocks, and leave off cooing. The multitude thus collected during that season, is so disproportioned to those which continue here the whole year, as to render it certain that by far the greater part of them quit the country in the spring. It is most probable that these pass into Sweden and the adjoining countries, to breed; and return thus far southwards in autumn, from being unable to sustain the rigours of that climate in the winter months. They again begin to coo in March; soon after which, those that are left among us, commence their preparations for breeding.

THE PASSENGER PIGEON

Is about the size of the common pigeon, and its bill is black. Round the eyes there is a crimson mark; and the head, throat, and upper part of the body are ash-coloured. The sides of the neck are of a glossy, variable purple. The fore part of the neck and breast are vinaceous; and the under parts are the same, but paler. The tail is tolerably long. The legs are red, and the claws black. The passenger pigeons visit the different parts of North America, in enormous flocks. We ourselves have seen them there in countless thousands. In the southern provinces their numbers depend greatly on the mildness or severity of the season; for, in very mild weather, few or none of them are to be seen. Actuated by necessity, they change their situations in search of acorns, mast, and berries, which the warmer provinces yield in vast abundance. When they alight, the ground is quickly cleared of all esculent fruits, to the great injury of the hog, and other mast-eating animals. After having devoured everything that has fallen on the surface, they form themselves into a great perpendicular column, and fly round the boughs of trees, from top to bottom, beating down the acorns with their wings; and then they alight, in succession, on the earth, and again begin to eat.

THE TURTLE-DOVE.

This is the *Columba Turtur* of Linnæus, and is famed, from the earliest times, for its plaintive and tender note. The length of this bird is nearly twelve inches. The bill is brown; the eyes yellow, and surrounded with a crimson circle; whilst the top of the head is ash colour, mixed with olive. On each side of the neck there is a spot of black feathers, tipped with white. The back is an ash colour, with each feather fringed with a reddish brown; and the wing-coverts and scapulars are likewise of a reddish hue, slightly spotted with black. The quill-feathers are dusky, with pale edges. The fore part of the neck and breast is of a light-purplish red; and the belly, thighs, and vent are white. The two middle feathers of the tail are brown; the others dusky, and tipped with white. The two outermost are also edged with the same, and the legs are of a reddish hue.

In addressing his note, the male turtle-dove makes use of a variety of winning attitudes, cooing at the same time in the most gentle and soothing strains. This has given rise to his emblematical representation of connubial attachment and happiness. These birds arrive in this country late in the spring, and depart about the latter end of August. They frequent the thickest and best-sheltered localities of woods and plantations, where they build their nests on the highest parts of the loftiest trees. The female lays two eggs, and, in our island, has only one brood; but in warmer climates she is supposed to breed several times in the course of the year. Turtle-doves are pretty common in Kent, where they are sometimes seen in flocks of from twenty to thirty, frequenting the pea-fields, where, it is said, they do great damage. Their stay seldom exceeds four or five months, during which time they pair, build their nests, and rear their young, until they are strong enough to follow them in their retreat.

A variety of the common turtle has been described by the name of the "spotted-necked turtle-dove." The difference consists in the whole side of the neck being black; and instead of those feathers being tipped with white, there is a round spot of white on each, very near the end. Dr. Latham says this bird was shot in Buckinghamshire, and that he observed one of these amongst some birds that came from the last expedition to the South Seas; but as it was in a parcel wherein were some which belonged to the Cape of Good Hope, it is possible that this single bird might come from that place. The bastard produce of the common turtle with the turtle of the aviary, has been proved by frequent experiments to be barren, although the two species whence it originates appear to be closely allied, and a mixed breed is easily produced.

Pigeon-shooting is, in this country, both a sporting and a gambling amusement. We have already observed that the varieties of the pigeon family are very numerous, and naturalists and ornithological writers have differed considerably on the subject of their classification. Linnæus places them among *sparrows*, upon the ground that both species pair in the season of love; both work jointly in forming the nest, and take their turns in sitting on

the eggs. La Vaillant classifies them under three sections: 1st, *colombes*, *ramiers*, and *tourterelles*; 2nd, *columbars*; 3rd, *colombi-gallines*.

PIGEON-MATCH SHOOTING.

When pigeon-match shooting first commenced in England, it is difficult to say. It is noticed at length, and as an established sport, in the *Sporting Magazine*, before the close of the last century. The account given of it there, shows that the sport, as it was then followed, was pretty much the same as it is at the present day. Pigeons require to be bred for shooting-matches; and, for this purpose, a commodious place to rear and protect them is necessary. This, of course, will be varied according to the circumstances and position of the pigeon-breeder. But whatever be the size or shape of the dove-cote, it must have two holes or rooms for the birds to nest in. Without this arrangement there will be constant confusion, and the eggs will get broken continually. A dove-cote, entirely isolated, will prove more secure than any other, as vermin will then find it difficult, and in some cases impossible, to shelter themselves in it. When pigeons are kept in a room, and have to lay their eggs on the floor, they are liable to be destroyed by rats.

Every dove-cote should, if possible, have a south-west aspect; and if a room be fixed upon for that purpose, a hole may be made in the roof of the building for the passage of the birds, and a platform constructed at the entrance for the pigeons to alight upon, and with some defence against cats, which will often destroy a whole dove-cote in a single night. If cats can be reared to be familiar with pigeons, then they may become guardians instead of destroyers of them, and prevent the cote from being invaded by rats or mice. This platform should be painted white, which is a favourite colour with the birds, and it is likewise conspicuous as a mark to enable them to find their way home. The boxes should also be coloured, and renewed whenever necessary; for which purpose lime and water will be sufficient.

Cleanliness is of great importance in a dove-cote, to prevent the birds from becoming infested with vermin, and also to keep them otherwise healthy. All dove-cotes should, therefore, be cleaned at least once a week, and the pigeons ought to be kept well supplied with water to drink. When confined in a room, they should be allowed a wide pan of water; and this should often be renewed, as a bath, which cools, refreshes, and assists them to keep their bodies clear of vermin. In attending to pigeons, care should be taken that they do not fight, as, when this occurs, both the eggs and young are endangered.

The common barrel dove-cote is very common, and, no doubt, found very suitable for a pigeon-house. It is to be seen in almost every situation where pigeons are kept.

PIGEON-BREEDING.

In pairing pigeons for breeding, a considerable degree of care is necessary. It may be done according to the fancy of the keepers, for the purpose of varying the colours, or with any other view. Old pigeons are difficult to retain securely, as they are apt to fly away on every opportunity of gaining their freedom. It is better to have what are called *squakers*, or such as have not yet flown: these, being confined, well fed, and gradually accustomed to the surrounding scenery before they have acquired sufficient strength of wing to fly from their cotes, will, in a short time, become perfectly domesticated.

In a room or loft appropriated to the rearing of pigeons, the shelves should be placed sufficiently high to secure them against the attacks of vermin. It is recommended that the usual breadth of the shelves should be about twenty inches, with the allowance of eighteen between shelf and shelf, which will be quite enough not to incommode the tallest birds. Partitions between the shelves should be fixed at the distance of about three feet, making a blind, by a board nailed against the front of each partition, where there will be two nests in the space of every three feet; so that the pigeons will sit in privacy, and not be liable to be disturbed. Or, a partition may be fixed between each nest; which will prevent the young from running to the hen, sitting over fresh eggs, and perhaps occasion her to cool and addle them; for, when the young are about a fortnight or three weeks old, a good hen will leave them to the care of the cock, and lay again.

The food and water given to pigeons should be so disposed as not to allow them to soil themselves in any way. Earthen pans may be used for this; but there are neat meat-boxes and water-bottles made for the purpose; which are excellent things, and preserve great cleanliness in feeding. The meat-box is formed in the shape of a hopper, covered at the top to preserve the grain from dirt, which descends into a square hollow box. Some fence this off with rails or holes on each side, to keep the grain from being scattered over; others again leave it quite open, that the young birds may the more readily get at their food. The water-bottle is made of glass, with a long neck, holding from one to five gallons; it is shaped like an egg, so that the pigeons may not alight upon and soil it. It is placed upon a stand, or three-footed stool, made hollow above to receive the belly of the bottle, and let the mouth into a small pan beneath. The water gradually descends out of the mouth of the bottle as the pigeons drink, and is thus kept sweet and clean. It always stops when the surface reaches the mouth of the bottle.

Pigeon-match shooting is still practised in many parts of England, and in the metropolis and suburban localities. The terms of these matches vary. Sometimes they are arranged for single, sometimes for double guns; occasionally for one weight of shot, and sometimes for another. Within the last few years, however, these matches have been on the decline, and are not now considered so fashionable as they were some years ago; more especially in the vicinity of the metropolis.

CHAPTER XV.

SMALL BIRDS.

Of late years there has, both in England and France, been considerable speculation among naturalists and farmers, in reference to the wanton destruction of small birds, which, by some, are supposed to do great damage to the crops of the agriculturist, robbing him of much of his grain, and thereby greatly reducing the value of his crops. On the other hand, it is argued that these birds are rather the guardians than the thieves of granivorous property; that, if they do take a little grain, it is as nothing, when compared with the quantity that they save by devouring innumerable insects, which, without their activity and voracity, would soon overspread the land Whichever of these opinions may be right, we will not stay to inquire; but, if admiration, as well as inclination, be permitted to have any weight in the matter, we should cry, "Spare the little birds!" There is, however, much wantonness and thoughtlessness exhibited, now-a-days, in the destruction of many of the "beauties of Nature," whether belonging to active or still-life. We would not in any degree discourage any fair use of God's creatures, either in the way of investigation or even sport; but a habit greatly prevails of useless destruction, whenever either rare beast, bird, or plant is met with in our rambles. Who that has wandered over the wilds of Snowdonia, has not mourned over the disappearance of many a rare plant, which might well have rewarded the toils of climbing, had it been left for the examination of him who loves to see Nature's rarest productions flourishing in their native wildness! Yet, the hand of the spoiler must root it up, and selfishly appropriate, perhaps, the last specimen. If a rare bird appears in any locality, numberless guns are at once levelled at it; when surely a moment's reflection would check such selfishness, and induce us to think that the more rare the bird or plant, the more we should be careful not to destroy it. Had a different and more rational spirit prevailed, we might still have had a sight of the bustard on Salisbury Plain, and the bittern in the marshes of Wales;

but these noble and beautiful works of Nature are now sought for in vain. Next to this ignorant mischief is the wanton destruction of harmless and useful birds. The wretched and wicked habit of almost all children seeking after and taking birds'-nests, with no other object than mere wilful destruction, is, we believe, conducive to many a wicked propensity in after-life. It is in itself not only a cruel, but a purloining act, and tends as much to blunt the natural sensibilities as it does to degrade the moral sentiments. Not to follow up this moral strain too deeply, we would notice one or two birds which, we think, are often destroyed more in a spirit of wantonness than of sport. These are the lapwing, peewit, or common plover, which is, perhaps, one of the most elegant inhabitants of the air, the white owl, and the starling. The first, in its elegant flight, with plaintive pipe, gamboling, and wheeling, and dipping over and around its mate, must have delighted every real lover of rural rambling. One would have supposed that the thousands of slugs that it lives upon, would have made it a peculiar pet of the farmer; and its vigilance of giving the alarm, if either weasel, crow, magpie, dog, or poacher cross its resting-place, ought to make it sacred to the gamekeeper; and yet how constantly is it destroyed through sheer thoughtlessness! So, likewise, the beautiful white owl, that best of mousers, how rare has it become! Its usefulness is without a drawback, and yet how wilfully is it persecuted! We know of hardly any sight so beautiful as to see this spirit of the early night, silently glide along the dim hedge-row, and then, light as the foam of the wave, perch upon the picturesque stump of some old tree. And so the starling, that endless mocker and imitator, that croaks and whistles, and screams and warbles in mockery of all its feathered songsters. Whether we see this bird among the countless myriads of his winter companions, winging his wonderful flight, without confusion, in that cloud of birds which darkens the wintry sky, or, at other times, when faithful to his native roof, separating himself and mate from that companionship, to chatter and flutter on the old-accustomed chimney or parapet; if we consider the countless worms and insects, their only food, which these never-tiring searchers must consume, no reflective mind would ever think of raising a gun against them. This same strain of sentiment might, we think, most usefully be carried out in reference to all the tribes of harmless birds. Let each man have his pet, and do his best to encourage its preservation.

If there is to be an exterminating war carried on against these little creatures, what is to become of the "music of our groves," and the multitude of poetical associations with which our small birds are linked in every mind? Our ornithological works will be read, by future generations, with the same sort of interest that we read of animals that lived before the flood; that *had* an existence, but that, long ago, became extinct, and are now only to be met with in a fossil state, imbedded in strata, or buried in long-concealed caverns.

THE COMMON STARLING.

Handsome in appearance, social in disposition, lively in manners, and harmless in its habits, the *Sturnus vulgaris*, or starling, is one of the best known and least molested birds which inhabit our green fields, lawns, parks, and pleasure grounds. It loves society, and, consequently, at almost all periods of the year, considerable flocks are met with, which range, feed, and roost together.

Starlings commence nest-building early in the year, occasionally during the third week in February, but more usually in March or April. They select a hole for a nest in an old weather-worn tree, a church-steeple, or the roof of a house; and having fixed upon one, they maintain possession of it with remarkable perseverance. A pair once fixing upon a hole beneath the rafter of a cottage, were found very troublesome, and the cock-bird was shot: the hen found another mate. Next time the hen was shot: the cock-bird paired again. Afterwards both were shot: another pair came and built. The hole was then plugged up with straw: they pulled it out piecemeal: it was next plastered over with mortar; they made a hole through it. They were afterwards allowed to tenant the spot, because it was so difficult to effect their ejection.

Starlings are particularly fond of parks which abound with ancient and venerable trees. As the nesting season comes in, these old domains present a busy and bustling aspect; for the

birds have nests in the cavities of the oaks, and are continually winging their way to and from them. The nest consists of a mass of stick, bents, shreds of cotton and feathers, and contains eggs about the end of April. It is occasionally composed of clean white straw; and, when this is the case, the eggs, which are of a delicate transparent blue, contrast very pleasingly with the light colour of the straw. Some eggs are dotted over with a few well-defined black spots, like those of the song-thrush. The young are hatched about the third week in May, and are principally fed with worms, both male and female assisting in the operation.

About September, the birds which have been reared in a particular district, collect in flocks, which, being augmented in number from other districts, grow gradually larger, until they consist sometimes of thousands; and when the whole body settles in a pasture, the ground (owing to the sable plumage of the birds) seems overspread with a wide, spacious pall. When affrighted, they all generally rise in a body, and, after wheeling through the air for some time, alight upon the top of a broad oak or elm tree, which seems nearly bowed down with the weight of its burden: when in such a situation, it is anything but pleasant to listen to their chattering voices. If attacked by hawks or other predatory birds, the flock rises on the wing, closes in, very compactly together, and presents a mass which, being constantly in motion, is not easily to be broken by their swift-winged enemies.

A naturalist writes—"On the 2nd of October, 1844, I noticed the most amazing flock of birds which it was ever my lot to witness—they were starlings. At a distance they resembled some gigantic mass of cloud slowly traversing the heavens, occasionally changing its form, and breaking into smaller masses. It was evening, and the birds had probably collected to roost for the night in a large wood, over the top of which they were enjoying the few moments before retiring to rest. The ease and elegance of their flight, as they wheeled to and fro—the firm and compact manner with which they kept together when moving in a mass—the peculiar facility with which the main army was broken into numberless smaller ones, and yet instantaneously united again, was perfectly astonishing, and excelled anything which I ever witnessed amongst the feathered tribes."

At particular seasons of the year, starlings frequently visit dove-cotes; and many people imagine that they do so to take the eggs and young pigeons. This idea, however, is erroneous. At Walton Hall, in Yorkshire, these birds were allowed to haunt the pigeon-cote for years, yet they were never seen to molest either the eggs or the young. The seasons in which they frequent dove-cotes, are spring and winter. At the former, their object, in repairing thither, is to build their nests in the pigeon-holes; at the latter, it is to roost, more especially in the cold nights. In districts where woods and trees are scarce, this is a frequent occurrence. Near East Ilsley, in Berkshire, as many as twelve dozen have been caught in a single evening, whilst roosting in a dove-cote.

THE REDWING.

The *Turdus Iliacus* of Linnæus is about five ounces in weight, and eight inches in length, with a dark-brown bill, deep hazel eyes, and the plumage, in general, similar to that of the thrush. A white streak runs over the eye, which distinguishes it from that bird. The belly is not quite so much spotted; and the sides of the body, and the general mass of feathers under the wings, are tinged with a lively red, which constitutes its peculiar characteristic, and which confers upon it its name. These birds arrive in this country a little earlier than the fieldfares, with which they *fraternise*, frequent the same localities, live upon the same kind of food, and to which they are very similar in their leading features. The redwing leaves in the spring, therefore its song is not known to us; but travellers tell us it is very harmonious and sweet. The female builds her nest in low bushes or hedges, and lays six eggs of a greenish-blue colour, dotted with small black spots.

The Romans held the flesh of the redwing in the highest estimation; and they kept thousands of them together in aviaries, and fed them with a species of paste, chiefly composed of bruised figs and flour, and on various other kinds of food. These receptacles were so constructed as to admit very little light; and every object which could remind the birds of

their former liberty, was sedulously kept out of sight, such as fields, woods, birds, or whatever might disturb or break in upon their memories, or impair their improvement. Under this treatment, the redwing fattened to a great extent, sold for a good price, and held a high place at the tables of this luxurious people.

Bewick tells us that a redwing was taken up, November 7th, 1785, at six o'clock in the morning, which, on its approach to land, had flown against the lighthouse at Tynemouth, and was so stunned, that it fell to the ground, and died soon after. The light, it is conjectured, had attracted its attention. The same writer observes, that when redwings appear on the eastern coast, they as commonly announce the approach of the woodcock, as does the arrival of the wryneck that of the cuckoo in the south. The best time for shooting this bird is in hard frosty weather; it is then more bold in keeping to its feeding-grounds, and is in greater numbers. The sportsman should, however, conceal himself as much as possible, as these birds set scouts to watch the approach of danger; and, on this account, it requires considerable art to get within range of them.

THE FIELDFARE.

This is the *Turdus Pilarus* of Linnæus, and is a very pretty bird. It is about ten inches long. The bill is yellow, and each corner of the mouth is furnished with a few black and bristly hairs. The eye is light brown, and the head and back part of the neck are of a light ashen hue; the former spotted with black. The coverts of the wings are of a deep hoary brown, the rump ash-coloured, and the throat and breast yellow, with regular spots of black. The belly and thighs are of a yellowish brown, and, in the young birds, more decidedly yellow.

There are some varieties of fieldfares which display a somewhat different plumage; but the differences are not very important. They are mostly confined to the comparative faintness of the black spots on the breast, or the greater predominance of white in various sections of the body.

This bird is migratory, and arrives in this country commonly in the first week in October; subject, however, to some variation on account of the weather. The character of the coming winter is supposed to be prognosticated by their appearance. If they arrive early, it is said that we shall have a hard season; if late, a mild one. They generally arrive in large flocks, and disappear about the latter end of February, or the beginning of March, and retire to Russia, Sweden, Norway, and as far as Siberia and Kamtschatka. Buffon tells us, they do not arrive in France till December, when they assemble in flocks of two and three thousand. Their food is haws and other berries, with worms, snails, and slugs.

The fieldfare being a shy bird, is difficult of approach with a gun. When they are in any considerable numbers, they appoint regular scouts to give the alarm of danger. They can, therefore, seldom be shot, except by stratagem; but they are easily killed, their feathers being loose, and their frames delicate.

Bewick says that fieldfares seem of a more social disposition than the throstle or the missels. They are sometimes seen singly; but, in general, form very numerous flocks, and fly in a body; and though they often spread themselves over the fields in search of food, they seldom lose sight of each other, but, when alarmed, fly off, and collect together upon the same tree.

THE THRUSH, OR THROSTLE.

This bird is often, in country districts, an object of the sportsman's attention, more especially if he be a young one. It is the *Turdus Mucius* of Linnæus, and is larger than the redwing, but less than the missel-thrush, to which, in other respects, it bears a great resemblance, both in form and colour. A small notch is found at its bill, which is characteristic of all the thrush species. The throat is white, and the spots on the breast are very regularly formed, and of a conical shape. The inside of the wings and the mouth are yellow; so likewise are the legs. The claws are strong and black.

The throstle is distinguished by its clear and harmonious notes, and is one of the principal songsters of the groves, taking the lead among the feathered tribes; which ought to preserve it from wanton destruction.

It is not properly migratory; but, in this country, is more numerous in particular places at some part of the year than at others; and this circumstance has given rise to the idea

that it goes, to a certain extent, from one country to another. The female builds her nest generally in bushes—the hazel, the thorn, and sometimes on the branches of trees. It is composed of dried grass, cemented together by clayey matter. Buffon maintains that these birds are migratory in France, and appear, in the southern section of the kingdom, about the end of September, and before either the redwing or fieldfare are seen. The female has not such a brilliant plumage as the male—the colours and spots being more blended and faint in the former than in the latter.

THE MISSEL THRUSH.

This bird is about eleven inches long, and is the *Turdus Viscivorus* of Linnæus. The bill is of a dusky hue, and the base of it yellow. The eyes are hazel. The head, back, and lesser coverts of the wings are of a deep olive colour, and the latter tipped with white, which, in some instances, is much more brilliant than in others. The lower portion of the back or rump is tinged with yellow; and the cheeks are of a yellowish white, spotted with brown; and so likewise are the belly and breast. The quills are brown, fringed with pale edges, and the tail-feathers are the same, the three outermost being tipped with white. The legs are yellow, and the claws are black.

The female builds her nest in bushes or low trees, and lays four or five eggs, of a greenish colour, irregularly marked with red spots. The nest is made of moss, leaves, and small fibres of twigs, and lined with dry grass. The bird commences early in the year to sing, even when the weather is stormy and ungenial; and this circumstance has induced country people, in many districts in England, to call it the *storm-cock*. It feeds on various kinds of berries, particularly those of the misletoe. It likewise feeds on caterpillars, and different kinds of insects, on which it chiefly rears its young. It is a native of almost every country in Europe, and, in some sections of the continent, is said to be migratory. It remains in England the entire year, and has frequently two broods in the season.

THE LARK.

This is the *Alauda Arvenis* of Linnæus, and is so common in this country, that it hardly requires a description here.

"The daisied lea he loves, where turfs of grass
Luxuriant crown the ridge; there, with his mate,
He founds his lowly house of withered herbs
And coarsest spear-grass; next, the inner work
With finer and still finer fibres lays,
Rounding it curious with his speckled breast."

This "herald of the morn," often made an object of sport by the thoughtless tyro, builds its nest upon the ground, where it is exposed to the depredations of many of the smaller animals of prey, as the weasel and the stoat. Mr. Mudie says—"The lark selects her ground with care, avoiding clayey places, unless she can find two clods so placed as that no part of a nest between them would be below the surface. In more friable soils she scrapes till she has not only formed a little cavity, but loosened the bottom of it to some depth. Over this the first layers are placed very loosely, so that if any rain should get in at the top, it may sink to the bottom, and there be absorbed by the soil. The edges of the nest are also raised a little above the surface; have a slope outwards, and are, as it were, thatched. The position in which the bird sits is a further security; and as the head is always turned to the weather, the feathers of the breast and throat completely prevent the rain from entering the nest at the side; while the wings and tail act as pent-houses in the other parts; and, if the weather be violent, and the rain fall at a small angle with the horizon, the fore part of the bird, upon which the plumage is thickest, receives the whole of it."

What is called the *twirling for larks*, is followed as an amusement in France, and is thus described:—These birds are attracted to a given spot, in considerable numbers, by a singular contrivance called a *mirror*. This is a small mahogany machine, shaped like a *chapeau-bras*, and highly polished; or else it is made up of common wood, inlaid with small bits of looking-glass, so as to reflect, upwards, the rays of the sun. It is fixed on the top of a thin iron rod, on an upright spindle, dropped through an iron hoop or ring, attached to a piece of wood to drive into the ground. By pulling a string fastened to the spindle, the mirror twirls round, and the reflected light unaccountably attracts the larks, which hover over it, and become a mark for the sportsman. There is often what the French call capital

sport in this way. Sometimes six dozen of these birds are shot before breakfast: sometimes the sportsman sits on the ground, and pulls the twirler himself, and sometimes a boy or servant is employed to do it. Ladies often participate in the amusement on a cold, dry morning, not by shooting, but by watching the sport. Occasionally there are ten or a dozen parties out together, firing at a distance of five or six hundred yards; and by this device the larks are kept constantly on the wing. The most favourable mornings are, when there is a gentle light frost, with little or no wind, and the sky clear. When cloudy the birds will not appear. To a bystander it would almost suggest the thought, that the larks themselves enjoyed their own destruction; for the fascination of the twirler is so strong, as to rob them of the usual fruits of experience. After being fired at several times, they return to the twirler, and form again into groups above it—some of them even flying down, and sitting upon the ground, within a yard or two of the astonishing instrument, looking at it this way and that way, and all ways together, as if nothing had happened. In some parts of Germany, larks are taken in great quantities; and we are informed by Dr. Latham, that the duty paid at Leipsic for these birds, amounts to twelve thousand crowns *per annum*, at twopence-halfpenny for every sixty larks.

In this country, some lark shooters, in winter—when there is a certain portion of snow on the ground, with hard frost—sweep a part of the snow from the surface, and strew it with a little chaff or grain. This area need not be more than twenty yards square. The birds will eagerly frequent it; and, by means of a natural hedge embankment, or an artificial screen, numbers of them are taken.

Speaking for ourselves, however, in this matter, we regret the destruction of every bird of song. Amongst all the enjoyments of this world, not the least is the music of birds, which, when combined with the elegance of their forms, the loveliness of their plumage, and the liveliness of their actions, are capable of affording pleasure to every ear or eye. As a study in natural history, that of birds is by far the most beautiful and interesting; yet how comparatively few are those who are acquainted with the habitudes of even those that are most common amongst us! It would really appear that many think that birds were created only to be shot, and for no other purpose whatever. "In natural history," says Mudie, "and more especially in the natural history of birds, which, from the fleetness of their aerial motions, carry the mind more readily and directly over the general map of the earth than any other class of the earth's productions, this inversion of the order of nature—this substitution of the end for the beginning—is peculiarly hurtful, and must be the cause why people, even well informed, otherwise, know so very little about the nature and habits of those species which are before their eyes every day, and which appear to come for the express purpose of being observed and studied. Take, as a familiar instance, the common redbreast, and ask your next neighbour when and where it builds its nest?—what are the number and colour of its eggs?—how long the incubation lasts?—how the young are fed, and on what?—and the chances are many to one that you do not get direct answers; and, if you do, they are the second-hand answers of someone who has written a description of the bird, which, if original at all, has most probably been obtained from observations made in a climate differing from yours, and, therefore, is not quite so accurate as the description of your redbreast. Carry your interrogations a little further. Ask what is the geographical distribution of the bird?—what are its uses in the general economy of nature?—and you will find the answers still more difficult to be obtained, and more unsatisfactory where you can obtain them." This is at least the case with those who dwell in cities.

CHAPTER XVI.

RABBITS.

THERE are four kinds of rabbits known among dealers and fanciers. They are called *warreners*, *parkers*, *hedgehogs*, and *sweethearts*. The warreners are widely distributed, and are to be found in almost every section of the British coast, where there are sand-banks, or mounds of any kind. Though all of one species, they vary considerably in size; those in the English warrens being greatly superior to those found in Scotland, both in bulk and flavour. The warren rabbits of the Irish coast are very much like those of Scotland; though, on the whole, a shade larger in bulk. The richest and finest are located in the warrens along the eastern coast of England, extending from Lincolnshire to Berwick-upon-Tweed. It is a curious fact, but, nevertheless, one well ascertained, that all the rabbits on the warrens in the west side of the island, are of a comparatively diminutive size, and, in many places, have a strong fishy taste.

Those who rent warrens with a view to commercial objects, seldom or ever allow shooting upon them. The reason is, that when a rabbit is wounded it will make for some hole or burrow; and it is known to regular shooters of them in such places, that so strong and powerful is this desire to get back to their holes, that, in the very struggles of death, rabbits will often succeed in getting into a sand-burrow. Now, we are informed by warreners, that if a wounded or dying rabbit get into a burrow, none of the living ones will ever pass it. They will die in their holes first; so that a single wounded or dead animal will cause the death of perhaps a score of its own kind in the same locality. This, as a matter of course, becomes a serious loss to the proprietor of a warren. As much as a couple of guineas have been offered for two or three shots in a warren, and refused, solely upon this ground.

The obstinacy of the rabbit is curious; and it is equally, if not more singular, in reference to the ferret. This little animal is often used by sportsmen to make the rabbits spring out of their holes; they are also very extensively used by warreners to make them spring, and fall into small *poke-nets*, as they are called, placed at the mouths of the holes. These ferrets are sometimes long in coming forth from the warren-holes; when the warreners have to dig for them, and will perhaps find them lying, though muzzled, beside a dead rabbit, whose very brains have been scratched out, or its back-bone laid bare, rather than budge an inch for the ferret. This is a circumstance of daily occurrence in all the great rabbit warrens that lie on the eastern side of the island in the north of England. Nothing injures the productive remuneration of a regular warren so much as shooting over it, even though it be but for a week or two in a season.

The *parker* and the *hedgehog* rabbits are very much alike. They both frequent plantations, and high inland rocky ground, and are nearly of the same length and weight as the general run of Scotch and Irish rabbits. In many parts of England, and even in Scotland, it has, of late years, been a custom among gentlemen of landed estates, who are much attached to fox-hunting, to introduce these parker and hedgehog rabbits into certain localities of their grounds, with a view of supporting the foxes. But we believe that, in numerous cases, the rabbits are found to breed in such prodigious numbers, that they become a regular nuisance, and very difficult indeed to root out again. Besides, the practice has given rise to serious disputes and bickerings among farmers and their landlords, about the destruction of the crops of grain by the rabbits in such places. A person of considerable experience, writing on the wild rabbit, says—"It would be no easy matter to say what weight a wild rabbit would attain if taken and fed like any of those prize animals, such as sheep, cattle, &c.; for in the case of sheep, the difference of feeding, against the natural food which the animal seeks for itself, is almost incredible, at least to those who have

not seen the effects, or paid any attention to the matter. But I am afraid I am getting out of my way. I had a good opportunity, one season, of seeing the size, and trying the weight of rabbits, as I have been in at the death of very few short of 500; and I must say, I never have killed any above 5 lbs., most of them being from 3½ lbs. to 4 lbs.; in fact, I do not remember of more than one being above 4½ lbs., and very few of the latter weight; but I did not weigh them all—only the very large ones attracted my curiosity; and it is rather singular that the largest rabbits were always killed by means of the ferret, and, in many cases, lay in the hole till killed by this blood-thirsty enemy. But I once witnessed a rabbit that was shot on a neighbouring estate, which weighed over 6 lbs. This was assuredly the common grey rabbit, in all but the ears and head, which were somewhat larger than the common, being nearly as large as those of a hare; but, at the same time, the head seemed to be quite in proportion to the body. The ears, however, were something the shape of the long-eared, domestic rabbit, but differed from it in being erect, in place of hanging down. The flesh of it was dressed, and was found to be that of the rabbit, thereby settling the notion that it was a cross with the hare. It has been stuffed as a curiosity; was shot in a high country; was quite wild; and is the greatest weight I have known a wild rabbit to attain."

With respect to the shooting of these animals in such localities, every degree of caution is requisite. It is indispensable that they should be approached in a straight line, even to obtain a glance at them; and this must be done by stealth. If you have a dog, he must be kept close to your heels. Stoop down, and prevent the animal from seeing you, if you can. This, and such like stratagems, are the only means to get a shot at this kind of rabbit.

"More difficult than hares to hit,
They frequently appear to flit
Like shadows past one—good, indeed,
Is then the aim that bids them bleed.
If you would see them nicely stopp'd
In the thick wood, you must adopt
Snap-shooting, for you'll seldom there
Have time to take them full and fair;
E'en lost to view, advance your gun
Quickly to where you *think* they run:
Regard not grass, nor brush, nor briar;
Through each and all that instant fire.
Bang! it's well—you saw him not,
And yet you've killed him on the spot."

In taking our leave of the rabbit, we may briefly allude to *hare* shooting, though this animal is more an object of the chase than of the gun. Yet, throughout the shooting season, there are a vast number of hares shot. Few sportsmen allow her to make her escape, when a chance offers. Some fowlers are remarkably clever at finding and shooting hares; and, with some, it becomes quite a passion, to the entire exclusion of every other kind of sporting. We have often seen an individual in a stubble-field, on a fine evening, crawling upon his knees, and sometimes on his side or his belly; and, without any dog, gaining upon poor puss so slowly but surely, that her death became certain. This shooter would never, however, fire at a hare in her seat in a hedge, or cover of any kind. She is not difficult to kill, and her mode of running is more favourable to the sportsman than the bouncing and stotting movements of the rabbit, which are apt to mar the young sportsman's aim.

CHAPTER XVII.

DEER-STALKING.

DEER-STALKING is comparatively a modern sport, and is confined principally to the higher classes of English sportsmen. The deer, it is well known, has been an interesting object of the chase from the earliest records of the human family. Stag-hunting is treated of by

Xenophon; and it forms a conspicuous item in Anglo-Saxon history. During the middle ages, we find that it was pursued in most of the countries of Europe. As practised in those parts of the Highlands of Scotland, and in other mountainous countries, deer-stalking is by no means a drawing-room amusement. It keeps the powers of both mind and body upon the full stretch, and takes us into scenes of the most magnificent and sublime description.

In the *Pennyless Pilgrim*, of Taylor, the water-poet, who flourished about a couple of centuries ago, we find the following description of deer-stalking as it was pursued at that time:—"I thank my good Lord Erskine; he commanded that I should always be lodged in his lodging, the kitchen being always on the side of a bank, many kettles and pots boiling, and many spits turning and winding, with great variety of cheer, as pigeons, hens, capons, chickens, partridge, moorcocks, heathcocks, capercallies, and ptarmigans; good ale, sack, white and claret, and most potent *aqua vitæ*. All these birds, &c., and more, we had continually in superfluous abundance, caught by our falconers, fowlers, fishers, and brought by my Lord Marr's tenants and purveyors to victual our camp, which consisted of fourteen or fifteen hundred men and horses. The manner of hunting is this: five or six hundred men do rise early in the morning, and they do disperse themselves divers ways, and seven, eight, or ten miles' compass, they do bring or chase in the deer in many herds (two, three, or four hundred in a herd), to such or such a place, as the noblemen shall appoint them; then, when the day is come, the lords and gentlemen of their companies do ride and go to the said places, sometimes wading up to the middle through burns and rivers; and then they, being come to the place, do lie down on the ground till their foresaid scouts, which are called the tinckell, do bring down the deer; but as the proverb says of a bad cook, so these tinckell men do lick their own fingers; for besides their bows and arrows, which they carry with them, we can hear now and then an arquebuss or musket-shot go off, which they do seldom discharge in vain; then, after we had stayed three hours, or thereabouts, we might perceive the deer appear on the hills round about; which, being followed close, are chased down into the valley where we lay; then, all the valley on each side being waylaid with a hundred couple of strong Irish greyhounds, they are let loose, as occasion serves, upon the herd of deer, that with dogs, guns, arrows, darts, in the space of two hours, fourscore fat deer were slain."

At the great hunting gatherings which took place in Scotland, under the auspices of the chief nobility, during the sixteenth and seventeenth centuries, fire-arms were occasionally used to kill the red deer. These hunting *forays* were conducted upon a most gigantic scale of magnificence, and were attended by many thousands of the clansmen, who encompassed extensive tracts of country, and drove the game to where their respective chiefs were located. In an entertainment of this kind given by the Earl of Athol to James V., the queen, his mother, the pope's ambassador, and many hundreds of the most distinguished ladies and gentlemen of the court, there was a kind of palace constructed, of green timber, interwoven with boughs, provided with turrets, and moated completely round. The hunting continued three days; and we are told that many of the animals were shot with the gun, through the apertures of the rough building; and that even some of the ladies were bold enough to fire off some of those field-pieces, which were then of considerable size.

The natural shyness or wariness of the deer, suggests many devices to overreach them. Almost every sportsman has some general method of his own to get fairly within range of them, some of which have been immortalised by Sir E. Landseer upon the canvas. The sportsman must always approach them up-wind, to prevent his being scented, for they possess the faculty of smell in high perfection. Sometimes a circuit of several miles has to be taken before they can be approached so as to give a fair chance of sport. Weather, as in every other sport, has much to do with success in deer-stalking. When this is of such a kind as to oblige the deer to frequent the well-heads, or pools of water, and more especially if these be in a locality where there is any portion of brushwood or shelter for the gunner, then his chances of success are considerably increased. If otherwise, the labour, of course, is considerably more severe, and the chances of good sport less likely to be so plentiful.

In order the more certainly to bring down the deer, the sportsman always, if possible, takes his aim behind the shoulder of the animal; and if effective in this direction, death follows instantly. When, however, the deer is only wounded, it is then left to itself by the herd, when the deer-hounds are set to work to follow and capture it. These animals display singular sagacity and earnestness in hunting the stricken captive: they will confine their hunting solely to the wounded deer; and when they have overtaken him, either seize, or hold him at bay till the sportsmen arrive, when another shot, in some vital quarter, puts an end to the scene. The dogs are rewarded by the blood of the noble quarry.

Shooting the roebuck in the Highlands of Scotland, is held to be a most animating sport. This animal is considerably smaller than the red-deer; and dogs of the harrier breed are used to drive it into certain favourable localities, where the deadly rifle does great execution. Shooting it, and all the sporting incidents and circumstances attending this, are much of the same description as those mentioned in reference to the red-deer: but it is impossible to describe the irresistible pleasure which the pursuit of such a noble quarry gives to the thorough-bred highlander. Day after day he will range the bare hills, and traverse the haunts of these animals, or sit, with Job-like patience, enveloped in his plaid, behind a grey rock, which, whilst it conceals him, enables him to command an extensive view of the country spread out before him. Should he then be fortunate enough to get a sight of a stag, he will think nothing of creeping for miles, like a worm, on his belly, in order to get within shot of him without being discovered. Time and the weather are to the highlander of no consequence. Wet, cold, and hunger he will willingly bear to circumvent his prey; and if he is successful in this, how does he rejoice! but if not, he will renew his efforts until his perseverance and toil are rewarded with success. When a deer is killed, an operation called "breaking" takes place, and which consists of cutting the throat and disembowelling it. Whilst this is going on, the highlander frequently apostrophises the dead animal in Gaelic. He calls him every evil name he can think of at first, for perhaps having frequently escaped his deadly aim, and for having often led him many a weary journey over hill and dale before he had at last succumbed. After this, he may change his note, and pronounce him the "bonniest," or most beautiful beast that it was ever his lot to behold. Whilst upon this strain, the very perfection of gratification and delight irradiates every feature of his usually hard and rugged countenance.

In bidding adieu to this portion of our work, we must be permitted to say a few words upon natural history, and the great additional enjoyment its study must give to the sportsman who associates it with his pursuits. In itself it is delightful; and animals are so diversified in form, so curious in structure, and so interesting in their habits and manners, that they furnish a wide range for observation to every inquiring mind. They are, moreover, so liberally distributed over the earth's surface, that, let the naturalist wander where he will, he is almost sure to meet with one species or other of the object of his pursuit. The daisied meadow has its lark; the wood its nightingale; the heath-clad hill its red-deer or its roebuck; the stream its grayling or its trout; the rocky dell its ouzel, flitting from bush to bush, or crag to crag. Nay, even the ocean-wave has its inhabitants its algæ, or its birds, as the snow-capped mountain has its ptarmigan. What life, what interest, what spirit do these various beings infuse into the elements which they people! The field may look beautiful, clad in its spring-tide robe, with the sun glancing brightly upon its thousand flowers; but if the thrush plays its flute from a neighbouring tree, or the lark rains down music from a summer cloud, how greatly are its charms enhanced by their dulcet notes! Enchanting may seem the river, as it winds gracefully through some pastoral vale, an evening sun perchance turning to gold the liquid silver of its currents; but, should the osprey pounce down upon its waves, or the otter move stealthily along its margin in search of prey, what interest, what animation do they give to the lovely scene!

One is almost led to believe that the love of nature is inherent in the heart of man. It is visible in earliest life, when children evince a

desire to ramble amidst pleasant fields, to gambol on banks of daisies, to cull buttercups, or to weave, for their hair, coronets of green rushes. In the breasts of many, this love "grows with the growth, and strengthens with the strength;" in some, it is well nigh extinguished; in others, it peeps out in a diminished form. In different ranks, it is exhibited under different aspects. What induced the elder Wortleys "to build a lone lodge on Wharncliffe?" Was it their love of solitude or retirement? Not exactly. We are told, "that they might resort unto it to hear the wild bucks bell." And what induces the magnates of modern times to pitch their tents periodically in the Highlands? Ostensibly to shoot the grouse, leister the salmon, or stalk the red-deer. Is this their only motive? Do they not exhibit a partiality for field sport because it brings them more immediately into contact with nature? They derive pleasure from hearing the whirr and cry of moorland fowls, from noting the habits of animals, or from observing the heath-covered hills under their ever-varying character of light and shade. And what pleasure do sportsmen take in detailing their experiences of these things, or describing the instinct and sagacity which their dogs have exhibited under various circumstances! Certainly such men are naturalists. The love of nature discloses itself perhaps more modestly in other ranks of life. Is it not manifested at the village parsonage, with its embowering creepers mantling the walls, and the carefully trained shrubs which decorate the garden? Does the six days' pent-up mechanic take up his Sunday stroll merely to inhale the fresh air, or to exercise his limbs? The songs of skyward birds, and the incense of delicate flowers, must, we think, give a zest to his walk. The same principle is visible in the tradesman, who loves his villa, with its grassy slopes and beds of flowers; in the husbandman, who has a longing to till fields and tend cattle, or to employ himself in those never-ending processes of agriculture, which are the natural employment of man. Nay, the love of nature exists even in the hearts of crowded cities. The intercourse of man with man, the strife of trade with trade, may have subdued, but not destroyed it. The rose, the lily, the mignonette, exhibited in the windows of the rich, and the half-starved, smoke-dried wretch of a geranium in the windows of the poor, alike attest that, although their possessors are cut off by barricades of brick and stone, from intercourse with nature in her woods and fields, their love for her is not entirely extinguished. May it increase, and with it all those enjoyments which generally follow in the train of innocent and edifying pursuits!

DIVISION IV.

CATTLE.

CHAPTER I.

WILD AND TAME CATTLE OF DIFFERENT COUNTRIES.

THE URUS AND THE AUROCHS OF THE ANCIENTS.

It requires no great amount of discernment to perceive how much man is indebted to the herds of the field, for supplying him with those necessaries of life by which his comfort is increased, and his happiness enlarged. The ox, in many parts of the globe, takes the place of the horse, in assisting him to cultivate the soil; and the cow supplies him with the most nutritious of all beverages. Milk, cream, cheese, and butter, enter largely into his dietary, and form a species of food and drink at once nourishing and agreeable. Even after death these useful animals are made subservient to his wants. Portions of their cooked carcasses become converted into the "roast beef of old England;" and their hides furnish the material for shoes; their horns are made into combs, and other articles of ornamentation; while their hoofs supply him with glue, and various gelatinous substances; their bones are fashioned into knife-handles, and applied to numerous other purposes; whilst their refuse, in the shape of dust, is restored to the earth whence they came, to help to multiply its productive power, and increase its vegetation, by which other animals may be raised, and their species perpetuated. Such is the important part which these patient animals perform in the grand scheme of creation! How much, then, does man owe to them for the many comforts, and even luxuries, they are the means of bringing within his reach! In natural history, these animals are designated as the genus *Bos* (oxen), and their characters are defined, as both sexes having horns; but they have neither suborbital sinus, interdigital fossæ, nor inguinal pores. The teats in the females are four. The animals of this genus are, with some few exceptions, the largest and most massive of the hollow-horned Ruminants. Their limbs are low and strong; their bodies heavy, with wide haunches, and thick, and often elevated shoulders; their heads are large; and the progressive increase of their horns is marked by annuli at the base. They sheathe a hollow or cancellous bony core, continued from the sides of a bold frontal ridge. The forehead, or chaffron, is expanded; the muzzle, except in the sub-genus *Ovibos*, is broad, naked, and moist; the neck is thick, deep, compressed laterally, carried horizontally, and furnished with a pendent dewlap. The spinous processes of the anterior dorsal vertebræ, at the withers, are very long and stout. All the Ox group are gregarious in their habits; and no quarter of the globe is destitute of its indigenous species, existing in a state of freedom, tenanting the deep glades of the forest, or roaming over hills or plains. The genus may be subdivided into the following minor groups, or sub-genera:—Bos, Anoa, Bubalus, Bison, and Ovibos; descriptions of which we will give in their proper places, as they rise before us, in this division.

The Ox (*Bos Taurus*) is now only known as a domesticated animal, widely diffused over almost every region of the globe, and everywhere contributing, by its services and products, to the well-being of man. Although referred to as a domestic animal in the earliest ages, by the author of the Mosaic record, impenetrable darkness hangs over its primeval history; nor is its wild origin known, or whether that origin is in existence. Temperature, soil, food, a thousand circumstances, operating through the revolutions of years, have

combined to effect a series of modifications in the ox. Every country possesses its peculiar races; and these races, by their intermixture, are perpetually producing others; so that it is impossible to say to what extent these changes may be carried, and how far the original type may have already become modified. Certain it is, that we are acquainted with no animal in a state of original independence, to which the primitive type of the ox can be referred. It is true, however, that within the period of authentic history, certain wild oxen existed in Europe; but it is not to Europe that we must look as the cradle of the domestic ox; nor, indeed, are the accounts left us of these oxen reconcilable with any of them having been specifically identical with our domestic race, which, when we look at the Zebu breed, seems to claim more than one source. One of these wild animals was termed by the ancients Urus *(latis cornibus)*, and another, Bison *(jubatus*, or *villosus)*. We have also an animal described under the name of Bonasus—the Βόνασσος, or Βόνασος, of Aristotle.

The Urus, which existed in the Hercynian forest, is thus described by Cæsar:—"These uri are little inferior to elephants in size, but are bulls in their nature, colour, and figure. Great is their strength, and great their swiftness; nor do they spare man or beast when they have caught sight of either. These, when trapped in pitfalls, the hunters unsparingly kill. The youths, exercising themselves by this sort of hunting, are hardened by the toil; and those among them who have killed most, bringing with them the horns as testimonials, acquire great praise. But these uri cannot be habituated to man, or made tractable, not even when young. The great size of the horns, as well as the form and quality of them, differs much from the horns of our oxen. These, when carefully selected, the people ring round the edge with silver, and use to drink with at their ample feasts." Perhaps the wild bulls, with horns of extraordinary size, which Herodotus assures us inhabited Macedonia, were uri.

The Bison (*jubatus* of Pliny).—This species, regarded by Cuvier and most naturalists as identical with the Bonasus of Aristotle, is considered, and perhaps with reason, as referable to the Aurochs or Zubr (*Bos urus* of modern naturalists, not Urus of Cæsar), still existing in the wild forests of Lithuania. In Europe and Siberia, the fossil crania of aurochs are not uncommon; and these skulls, though they scarcely differ in anything from the Lithuanian animal, Cuvier inclines to think may be of a different, though closely-allied species. He gives the figures of a skull in the Paris museum, so like, as he observes, to the living aurochs, that the most practised eye can scarcely distinguish it; and also so fresh, that he is in doubt whether it be really a fossil relic, or, on the contrary, recent, owing its fossil appearance to having been much weathered. Mr. Lyell states, that the bones of the auroch or bison have been found in the North Cliff, in the county of York, in a lacustrine formation, in which all the land and fresh-water shells, thirteen in number, can be identified with species and varieties now existing in that county. The Urus of Cæsar and the ancients was characterised by the immensity of its horns, and its vast stature; in the former of which it differs materially from the ancient full-maned bison, or Lithuanian auroch. This urus no longer, as it would appear, exists; but fossil skulls, of a species far exceeding the largest domestic ox in magnitude, with the core of massive horns, are abundant in the superficial strata of Europe. This species is termed, by Cuvier, *Bos primigenius;* and he carefully distinguishes the skull from that of the fossil auroch. In a specimen found at Melksham, and described by Mr. Woods, the cores of the horns measured, at their widest expansion, upwards of four feet. We may easily conceive what must have been the expansion of the horns themselves: the skull, destitute of the lower jaw, and not perfect otherwise, weighed sixty-three pounds. Larger specimens, however, have been discovered.

This extinct species Cuvier regards as the type of the domestic ox; in which opinion Mr. Bell and most naturalists coincide, at the same time that they consider the "celebrated white, wild oxen of Craven, of Chillingham Park, and Scotland, as specifically the same with the common ox. Contrary to this, however, Colonel Hamilton Smith and Mr. Swainson regard the white ox of Chillingham Park (*Bos Scoticus* of some authors) as distinct from the common ox. The former regards the Chillingham ox

as a white variety of the fossil species *Bos primigenius;* while Mr. Swainson believes it to be the descendant of a smaller species belonging to the same genus as the *Bos primigenius*, or ancient urus, of which "the skulls exhibit the type of a form essentially different from that of the domestic ox."

"All these skulls," he continues, "are nearly one-third larger than those of the *Bos Taurus:* they are square from the orbits to the occipital crest, and somewhat hollow at the forehead. The horns, placed at the side of the above crest, show a peculiar rise from their roots upwards; then bending outwards, and then forwards and inwards. No domestic races show this turn; but numerous specimens of inferior sizes, found fossil in the Cornish mines, have this shape; and the wild bull of Scotland, the only example of this type now known to exist, retains it. The domestic oxen, on the contrary, of whatsoever country or breed they may be, have the square concave forehead, with the horns rising from the ends of the frontal ridge * * * * It appears, then, that the ancient urus, or wild bull, was a perfectly wild, savage, and untameable animal: not only does every account handed down from remote antiquity assure us of this, but it is even verified by the only living example of this form we possess—the *Bos Scoticus*, still preserved in one or two of the northern parks. Although domesticated so far as to live within such precincts without absolute unprovoked violence to its keepers, it retains essentially all the savage characters ascribed to the more powerful species mentioned by the ancients." As to the specific identity of the white oxen of Chillingham with our ordinary breed, some have no doubt on the subject. In size, form, and aspect they resemble the finer breeds of black cattle; and the query is, not—Are they distinct? but—Are they the descendants of a wild breed, or, on the contrary, the descendants of domesticated individuals, which have resumed their wild character, "from having ceased to feel, through many generations, the effects of human domination?" The latter is suspected. With regard to Cuvier's *Bos primigenius*, granting it to be the urus of Cæsar, it is not so easy to determine whether it was the wild type of the domestic ox. Its vast size, and the extraordinary magnitude of the horns, to say nothing of its ferocity, and the probability that it is to Central Asia, rather than to the wild forests of Central Europe, that we ought to look for the type of the domestic race (or races?), are sufficient to beget a doubt.

The term urus is evidently identical with the terms auer, ur, aurochs, ure-ox, the root also of the word taurus; and we agree with Mr. Woods, in the belief that the aurochs, or ure-ox, of the ancient Germans, was the urus of Cæsar; but that the word, on the extinction of that animal, became transferred to the bison of the ancients, now known as the aurochs; and also under names derived from a different root, as zubr (Lithuanian), zimbr (Moldavian), bison, vison, wisont, and wisant; whence bonasus, monasus, &c.

Besides the *Bos primigenius*, the following fossil species of ox have been named:—*Bos trechocerus* (Hermann von Meyer), subapennine beds; *Bos* (Bison) *priscus* (Bojanus), *Buffle fossile de Sibérie* (Cuv.), *Bos latifrons* (Harlan), Broadheaded fossil Bison and *Bison fossilis*, "diluvium" of Europe and North America, bone-caves and bone breccias; *Bos* (Bison)? *bombifrons* (Harlan), Big-bone-lick, North America; *Bos Pallasii* (Dekay), *Bos moschatus fossilis? Bos canaliculatus* (Fischer)? Siberia and North America; *Bos velaunus* (Robert), Cussac, Haute Loire.

Abundant remains of the ox were found by Captain Cautley in the Sewalik Mountains, at the southern foot of the Himalayas, between the Sutlej and the Ganges, partly lying on the slopes among the ruins of fallen cliffs, and partly *in situ* in the sandstone, in company with the bones of the mastodon, elephant, rhinoceros, hippopotamus, hog, horse (comparatively scarce), elk, deer, several varieties; carnivora, canine and feline (comparatively scarce); crocodile, gavial, emys, trionyx, and fishes. There were also portions of undescribed mammalia.

CATTLE IN THE PATRIARCHAL AGES.

To Asia and its border-lands let us turn our attention—regions in which the ox, from the earliest epoch, has been in a state of domestication, and where this animal, with sheep and goats, constituted the riches of patriarchs, and chiefs, or princes, who deemed it not beneath them to take an active interest in the management of their flocks and herds. In that age of

patriarchal simplicity, such scenes as we have seen delineated by the pencil of Berghem were not imaginary; and the pastoral poetry of classical antiquity has not only rendered them familiar, but thrown an air of grace, and even dignity over them.

In the fourth chapter of the Book of Genesis (ver. 20) we read of Jabal, that "he was the father of such as dwelt in tents, and of such as have cattle." In the thirteenth chapter of the same book, cattle are enumerated as forming part of the riches of Abraham, and also of Lot; and in the previous chapter we read, that oxen were presented by the Pharaoh of Egypt, together with sheep, asses, and camels, to Abram, during his sojourn in that land. In the eighteenth chapter, veal, or the flesh of the calf, and butter and milk, are mentioned as articles of food. Subsequently, abundant mention is made of all these domestic animals; while, at the same time, we glean that a wild race of oxen long continued to exist in Syria and the adjacent regions. For instance, in the Mosaic injunctions regarding animals to be used as food (Deut. xiv. 5), the wild ox is expressly noticed; and Isaiah alludes also to the wild bull, "as a wild bull in a net." Hence it would appear, that though a domestic breed, established at a period antecedent to historical record, the Scripture outline excepted, formed part of the wealth of man in the primeval ages of his history, that a wild race still tenanted their aboriginal pasture-lands. Wild oxen are exhibited in the Egyptian sculptures, and they are frequently represented as objects of the chase. They were sometimes hunted with dogs, the huntsmen bearing bows and arrows; and sometimes they were caught with the noose or lasso.

The utility of the ox was highly appreciated in remote ages, insomuch, that it became an emblematic object of worship among most of the nations of antiquity. The traditions of every Celtic nation place the cow on the list of the earliest of animals, and represent it as a kind of divinity. Among the Egyptians, the god Apis was worshipped in the form of a bull; and Herodotus describes the ceremonies performed at the choosing of this bovine deity, to whose honour other bulls, chosen by the priests, were sacrificed. The goddess Isis was represented, by the same people, by the figure of a woman with the horns of a cow, as the Grecians represented Io; and the sacrificial offering was a bullock. The cow was never sacrificed, being sacred to Isis. The veneration of the cow was equally prevalent in Lybia. The people of that country, says Herodotus, from Egypt to the Lake Tritonis, are breeders of cattle, eat flesh, and drink milk, but abstain from the flesh of cows, as do also the Egyptians; and they will not keep swine. Nay, among the women of Syrene, to strike a cow is accounted a crime, because they celebrate the feasts and festivals of the Egyptian Isis. Neither will the Barcæan women taste the flesh of a hog or of a cow.

In India, where, in many points, the practice and worship of the ancient nations were the same as those of the Egyptians, the ox was held sacred, and still is so by the Brahmins. One of the causes of the Sepoy rebellion of 1857, is ascribed to some imaginary greased cartridges having been served out to the native soldiery. The religious writings of India say that the cow was the first animal created by the three gods, who were directed by the supreme lord to furnish the earth with animated beings. In the sculptures of the cave-temples of Ellora, the sacred bull is represented with great truth and spirit. In the *Transactions of the Royal Asiatic Society*, vol. ii., page 560, Colonel Tod says—"In Hindu mythology, the bull Nanda is at once the guardian of one of the two gates of heaven, of Iswaro or Bal-Siva, and his steed. The astronomic allusion thus blended with mythology is evident—viz., the entrance of the sun into the sign Taurus, the equinoctial festival of remote antiquity, and regarded as a jubilee by the Indo-Scythic nations hemming the shores of the Mediterranean to the Indian Ocean." We need not say how the idolatry of the Egyptians affected the Israelites, and mingled itself with the religious ceremonies of other nations, whose worship required the ox as a sacrifice to imaginary deities.

The estimation in which the ox was held, and which led to its consecration, did not arise from the circumstance alone of the cow yielding milk, or from the value of the flesh of the animal as food, but from its services in agricultural labour. It was employed as a beast of burden, for the cart, for the plough, and for treading out the grain from the ear. The Mosaic ritual lays down several rules

respecting the treatment of the ox: one forbids the yoking together of the ass and the ox in the same plough, perhaps from the inequality of their size and strength, which would render the draught irregular, and oppress both animals. Another injunction is, "Thou shalt not muzzle the ox when he treadeth out the corn." The first idea suggested by this passage is, that the operation of threshing was effected simply by the feet of the cattle passing over the sheaves; and such, indeed, was the case in the times of patriarchal simplicity. Afterwards, as other passages show, rollers and wheels of wood, and threshing instruments with teeth, were used. These were drawn over the sheaves by oxen, and greatly facilitated the process. With respect to the primitive mode of threshing by means of the feet of oxen, there is express allusion made to it by Homer, leading us to the belief that the practice was common in his country at the period in which he flourished:—

"As with autumnal harvests covered o'er,
And thick bestrewn, lies Ceres' sacred floor,
Where round and round, with never-wearied pain,
The trampling steers break out th' unnumber'd grain."

The ancient Arabs, Egyptians, and Romans, as well as the ancient Greeks, threshed their corn in this manner. Virgil, in the first book of his Georgics, describes the manner in which the threshing-floor is to be laid down, showing that nothing like our modern mode of threshing could have been practised. In Syria, Egypt, and Nubia, at the present day, the grain is, as formerly, either trodden out by the feet of oxen or mules, or partly trodden out, and partly crushed out, by means of a roller, or other machine, which the oxen drag after them, and which, more or less, destroys the straw, and even injures the grain. There were two modes of threshing; viz., by the drag, and by the sledge upon rollers, which are still practised in Egypt, Syria, and Western Asia.

In these remote ages, and in these countries, oxen were used for drawing the plough, as they are in Egypt at the present day. This implement, however, was of very simple construction, as it still continues to be in the East, and is rather formed for superficially turning up a light soil, than for making deep furrows in heavy land. It appears that the ploughman, to work it effectively, was under the necessity of guiding it with great care, bending over it, and loading it, as much as possible, with his own weight, otherwise the share would only glide the surface, without making a furrow; and the slightest inattention, or cessation of his labour, would be followed by the dragging out of the share from the earth, or by irregularity in the depth and direction of the furrow; hence the expression of Pliny, "*arator, nisi incurvus prævaricatur.*"

THE ZEBU BREED.

The Zebu breed of oxen claims a few observations. Whether this breed be derived, as some contend, from a distinct origin from that of the ordinary ox, it is not easy to determine; let it suffice that it presents marked peculiarities which clearly characterise it. Narrow, high withers, surmounted by a large fatty hump; an arched back rising at the haunches, and suddenly falling to the tail; slender limbs; a large pendulous dewlap falling in folds; long pendent ears, and a peculiarly mild expression of the eye, are the characters which define the zebu race—a race varying in size from that of our largest cattle to that of a young calf. This breed is spread over India, China, and the Indian Islands. It is also found in Madagascar, and on the eastern coast of Africa, in the interior regions, and parts of the western coast, and is used for the ordinary purposes of draught and burden. India appears to be its parent country; and we may readily believe that, in remote ages, when an extensive commerce existed between that country and Egypt, it was introduced into the land of the Pharaohs. In Upper Egypt, Abyssinia, and Ethiopia, it is now almost exclusively prevalent; but in Lower Egypt, as we learn from Burckhardt, the zebu, or humped race, is unknown. In the ancient Egyptian representations of animals, both the humped race, and the ordinary ox, with long horns, are clearly depicted. It is the zebu ox which is sculptured in the cave-temples of Ellora, and the seven pagodas, as they are commonly called, at Mahámalaipur, on the Coromandel coast. These are proofs of the extreme antiquity of this breed, and of its distinctness, at a remote era, from the ordinary ox.

Buffon observes, that the ox without a dorsal

hump, which he erroneously terms the Auroch race, occupies the cold and temperate zones, and is thinly distributed towards the regions of the south. The contrary, however, is the fact. The ox with the hump, which he terms also erroneously the Bison race, exclusively occupies all the southern regions—namely, the entire continent of the Indian empire, the islands of the Eastern and Southern seas, and the whole of Africa, from Mount Atlas to the Cape of Good Hope, including Madagascar, and the island of St. Juan, on the channel of Mosambique. With respect to the Cape of Good Hope, it is certain that the zebu race does not prevail there, at least in the present day; but F. Leguat, in the narration of his *Voyages*, says, that "the oxen are of three sorts at the Cape of Good Hope, all of a large size, and very active. Some have a hump on the back; others have the horns long and pendent; while others have them turned up, and well shaped, as in English cattle."

With respect to the ox represented on the Greek and Roman sculptures—which is not of the true zebu race—it must be confessed that, in many points, and more particularly in the pendulous, folded dewlap, it resembled the zebu, and may probably have been the ultimate product of a mixture of the zebu race, introduced at an early date from India, with the ordinary cattle of Greece and Italy. This, however, is a mere supposition. In the Greek sculptures the ox is represented without any hump, but the withers are high, and the crupper rounded. "To the classical antiquary," says a talented writer, "we beg to suggest that the dewlap of the Brahmin bull offers an object of much attention and interest, by reason of its sharp and decided outline, and perpendicular creases or folds, wonderfully verifying the correctness of those Greek sculptures on bronze and marble, in medals and statuary, in which we see representations of Victory sacrificing a bull, of the oxen of Ceres, &c. These representations will no longer be considered out of drawing by those who may have an opportunity of examining the sacred bull of India, nor exaggerated in their fore quarters; although critics of the last century, less fortunate in this respect than the visitors of the Zoological Society's gardens, have determined them, without hesitation, to be altogether incorrect." Several beautiful specimens of the zebu ox, both of the large-sized variety, and also of the dwarf caste, are in the Zoological Gardens. They are remarkable for their docility and quiet temper.

Mr. Youatt informs us, that a beautiful zebu bull and cow, of the Nagore breed, were, on one occasion, exhibited at the Christmas Cattle-show; and adds, that they were bred by Lieutenant-colonel Skinner, on his farm at Danah, near Pokah, on the borders of the Bichaneer desert, a hundred miles to the westward of Delhi. They were of the finest breed of Indian cattle, used by the higher orders to draw their state carriages, and much valued for size, speed, and endurance. The specimens in question "arrived at Calcutta, a distance of 1,400 miles, when under six months old. They were sent as a present to Mr. Wood, who was then residing at Calcutta, and by whom they were forwarded to Mr. Perkins. Colonel Skinner had a large stock of them; and six or seven beasts were always kept saddled, to carry the military despatches. They remained saddled three or four hours; and, if not wanted in that time, fresh ones were brought out to relieve their companions. They would travel, with a soldier on their back, fifteen or sixteen hours in the day, at the rate of six miles an hour. The action of the Nagore cattle is particularly fine—nothing like the English cattle, with the sideway circular action of their hind legs. They bring their hind legs under them in as straight a line as the horse. They are very active, and can clear a five-barred gate with the greatest ease. Mr. Perkins had a calf which leaped over an iron fence higher than any five-barred gate, and the bull frequently jumped over the same fence in order to get at the water; and when he had drunk his fill, leaped back again. * * * Mr. Perkins observes, that the chief advantage of these Brahmin bulls would probably consist in their speed and strength, in both of which they surpass any of our breeds."

Of the extensive use and consequent value of the Brahmin or large zebu breed, in their native climate, we can scarcely form an adequate idea. In some parts of India the dwarf races are unknown, and the large is bred exclusively. According to an observation of Colonel Sykes, in the *Proceedings of the Zoological Society*, the Brinjarees, a singularly

erratic people, possess vast herds, and breed the Brahmin cattle on an extensive scale; "and an army rarely moves in the field without 15,000 or 20,000 bullocks to carry its grain. Dwarf cattle are not met in Dukhun." The buffalo, however, divides the palm of usefulness with the zebu in the agricultural labours of India, and is preferred for many purposes, on account of his more robust constitution. In the Mawals, or hilly tracts among the Ghauts, this animal supersedes the zebu. "In those tracts," says Colonel Sykes, "much rice is planted; and the male buffalo, from his superior hardihood, is much better suited to resist the effects of the heavy rains, and the splashy cultivation of rice, than the bullock. The female is also infinitely more valuable than the cow, from the very much greater quantity of milk she yields." In point of beauty and docility, there is no comparison between the heavy savage buffalo and the "Sacred bull of Bramah." Nor is the former ever devoted to Bal-Siva as a meritorious offering. On the contrary, it is common to meet with Brahmin bulls thus devoted, which wander at their pleasure, exempt from the servitude of the yoke, and which are regarded as endowed with a sacred character. The beautiful form and sleek appearance of these fortunate creatures, particularly engaged the notice of Bishop Heber. The first which the bishop met, in his journey, was grazing in a green paddy-field, and was branded on the haunches with the emblem of Siva. He crossed their path, and found them both tame and fearless; and seeing some grass in one of the European's hands, they coolly walked up and smelt it. These privileged bulls are turned out, when calves, on certain solemn occasions, by wealthy Hindoos, as acceptable offerings to the divinity Siva. To strike, or in any way to injure or molest one of them, is held as a mortal sin. "They feed," he observes, "where they choose, and devout persons take great delight in pampering them. They are exceeding pests in the villages near Calcutta; breaking into gardens, thrusting their noses into the stalls of fruiterers' and pastry-cooks' shops, and helping themselves without ceremony. Like other petted animals, they are sometimes mischievous; and are said to resent, with a push of their horns, any delay in gratifying their appetites or wishes."

Between this absurd reverence for consecrated bulls, and the ordinary treatment of the working ox, there is a vast distinction; the latter is harshly, and often severely treated. The cow, however, has more forbearance exercised towards her than, from the treatment of the ox, might be expected. Bishop Heber, speaking of the mode of treading out the corn still practised in India, relates the following:—"One of the Hindu farmers was threshing out a small kind of millet by driving oxen over it, round and round in a circle. They were just leaving off work as I came up; and a hind was bringing a large bundle of green Indian corn, weeded from the thick crop, for their provender. I observed, however, that the animals, during their previous employment, were not muzzled, according to the Scriptural rule; at the same time, they were kept so constantly moving, that a few mouthfuls were all they could get. While I was examining this heap of grain, and asking the old man some questions, his cows came for the evening; and I pleased him exceedingly, when the cowman ran forward to beat them from my path, by forbidding him to strike them. 'Good! good!' he said, with an air of much satisfaction; 'one must not beat cows.' It seems to me that the tender mercies of the Hindus towards animals, are exhausted on cows and Brahmin bulls only; for oxen they have no pity—they are treated with much severity." That the ox should be severely treated or employed in hard work by the Brahmins, seems a sort of contradiction to the principles by which these people profess to be guided; but such inconsistencies are too common to be surprising. Thévenot, who describes the zebu oxen of India as excellent both for the saddle and draft, adds, that some gallop as fast as a good horse; and goes on to state that they are equally used for the plough, and for coaches and chariots. They are harnessed by means of a long yoke at the end of the pole, which is placed on the neck of the two oxen, and the driver holds in his hand the cord which is attached to a small double cord passed through the gristle of the nose, instead of a bit in the mouth, as in the case of the horse.

It would appear that white oxen are highly esteemed in India, as they have also been in other parts of the world. Olearius notices the procession of an Indian prince, who was drawn

in a carriage by two white oxen, which had the neck short, and a hump between the shoulders, but which were as lively and active as horses. Bishop Heber observes, that the Thakoors, the nobility of the Rajpoots, generally travel in covered waggons drawn by white oxen, the horns of which they gild. Tavernier observes—"The two oxen which were harnessed to my carriage cost me nearly six hundred rupees. The reader need not be astonished at this price; for these are oxen of great strength, and can travel journeys of twelve to fifteen leagues a day for sixty days, and always on the trot. When they have done half their day's work, they have two or three balls, the size of a penny loaf, of wheaten flour kneaded with butter and coarse sugar; and, in the evening, their ordinary fare consists of chick-peas bruised and steeped half-an-hour in water." Of the docility, activity, and services of the zebu ox in India, much more need not be said. Numerous travellers, both in the past and present century, have borne the same testimony, and record observations bearing upon the same point.

PERSIAN OXEN.

Receding westward from India to Persia, we gradually lose the zebu race, or at least find it intermingled with that of another type. Chardin observes, that the oxen of Persia are like ours, excepting towards the frontiers of India, where they have the hunch on the back. Throughout the whole country, the ox is seldom eaten as food; it is only reared as a beast of burden or for tillage. Such as are used for burdens are shod with iron, in consequence of the stony mountains over which they have to travel. The shoeing of oxen, where the country is rugged and the roads hard or stony, is also practised in India, as Thévenot relates, but is not a general custom. The shoes are light, and two are placed on each foot, as the cloven character of the hoof necessarily requires, so that the natural freedom of each part is not impeded. In Persia, the bull is often made to fight with the lion, and sometimes comes off victorious, though dreadfully lacerated.

Thus much respecting the distinction between the zebu race of cattle and the ordinary breeds of Europe, and their apparently natural distribution. Whichever race or breed we contemplate, we shall find it adapted to the service and necessities of man, its value being in proportion. It will readily be admitted, however, that the interest which attaches to the ox does not arise from its intelligence, but from its absolute utility. The pleasure which the mind experiences when we gaze on peaceful herds, feeding in tranquil security, is of a complex origin—the result of an association of ideas, more or less remotely connected with the presence of these creatures; which, from time immemorial, have formed the wealth of man, and which have, therefore, engaged alike the attention of the statesman, the poet, and the philosopher.

THE GAYAL.

(*Bos Gavæus*). Gavaya, Sanse.; Gavaï, or Gayâl, Hind.; Gobaygoru, Beng.; Gaujangalí, Pers.; Methaná, Mountaineers (Cúcís, &c.), east of Silhet; Shiál, Mountaineers (Cúcís), east of Chatgaon; J'hongnua, Mugs; Núnec, Burmas; Gauvera, Ceylon.

India presents us with several species of wild oxen, independent of such as belong to the buffalo tribe, some of which are domesticated in certain districts, beyond which they are not dispersed; and such is the Gayâl. According to Mr. Macrae, the gayâl is found wild in the range of mountains which form the eastern boundary of the provinces of Arracan, Chittagong (Chatgaon), Tipura, and Silhet. The Cúcís, or Lunetas, a people inhabiting the hills immediately to the eastward of Chatgaon, have herds of them in a domesticated state. The animal is called Gabay in the Hindu Sástra; but, as it would appear, is little known beyond the limits of its native mountains, except to the inhabitants of the provinces above mentioned. We learn from the same author, that the gayâl is of a dull heavy appearance, but that its form, like that of the wild buffalo, indicates great strength and activity. Its disposition is gentle; and, in a wild state, on its native hills, it is not considered dangerous, never waiting the approach of man, much less standing and sustaining his attack. The Cúcís hunt the wild animals for the sake of their flesh. The gayâl is a tenant of the forest, and prefers the tender shoots and leaves of shrubs to grass. It never wallows in the mud like the buffalo. In a state of domestication among the Cúcís, it does not undergo any labour; nor is the

milk of the female (which, though small in quantity, is extremely rich) held in any request; the animals are bred and reared solely for the sake of their flesh and hides, of which latter the Cúcís make strong shields. These domesticated herds roam, at large, in their forests during the day, and return home to their villages in the evening, being taught to do this very early, by being fed, when young, every night with salt, which, to these animals, is extremely palatable. Though the Cúcís slaughter the domestic gayâl, the Hindus, in the province of Chatgaon, will not kill this animal (their gabay), which they hold in equal veneration with the cow; but they hunt and kill another gayâl (as l'gayâl, or Seloï), as they do the wild buffalo. The cry of the gayâl is a kind of lowing; shriller, but not so loud as that of the European ox, without any resemblance to the grunt of the buffalo. In size and shape it resembles the English bull; has short horns, which are distant at their bases, and rise in a gentle curve upwards and outwards, their transverse section near the base being ovate. The forehead is broad, and crowned with a tuft of lighter-coloured, long-curled hair; the dewlap is deep and pendent; there is no mane or hump as in the zebu, but the withers rise to a considerable elevation. The tail is short; the body covered with a tolerable coat of straight dark-brown hair; on the belly it is lighter coloured; and the legs and face are sometimes white. From various experiments, it is proved that the domestic gayâl will breed with the ordinary zebu cattle of India; but whether the offspring will interbreed with each other is yet to be ascertained.

THE GYALL.

(*Bos frontalis*, Lambert). In the seventh volume of the *Linnæan Transactions*, will be found the figure and description of a Gyall, which died in London, in 1842, by A. B. Lambert, Esq., who quotes the following letter from George Harris, Esq., who was well acquainted with the domestic gyall in its native country. Referring to a communication from Mr. Lambert, he writes—"I have before me your note, with the drawing, which appears to me to be the figure of the animal I mentioned to have in my possession. Some parts of the drawing seem to be rather too much enlarged, as the base of the horns and the rising between the fore shoulders. The animal I described to you, and which I have kept and reared these last seven years, and know by the name of the gyall, is a native of the hills to the north-east and east of the Company's province of Chittagong, in Bengal, inhabiting that range of hills which separates it from the country of Arracan. The male gyall is like our bull in shape and appearance, but I conceive not quite so tall, and of a blackish-brown colour; the horns short, but thick and strong towards the base, round which, and across the frons (chaffron), the hair is bushy, and of a dirty-white colour. The chest and forehead are broad and thick. He is naturally very bold, and will defend himself against any of the beasts of prey. The female differs little in appearance: her horns are not quite so large, and her make is somewhat more slender; she is very quiet, and used for all the purposes of the dairy, as also (I have been informed by the natives) for tilling the ground, and is more tractable than the buffalo. The milk which these cows give has a peculiar richness in it, arising, I should conceive, from their mode of feeding, which is always on the young shoots and branches of trees, in preference to grass. I constantly made it a practice to allow them to range abroad amongst the hills and jungles at Chittagong during the day to browse, a keeper attending to prevent their straying so far as to endanger losing them. They do not thrive in any part of Bengal so well as in the aforementioned province, and in the adjoining one, Tipperah, where, I believe, the animal is also to be found. I have heard of one instance of a female gyall breeding with a common bull."

Lesson, and the author of the article *Ox*, in the *Penny Cyclopædia*, seem to regard the gayâl and the gyall as distinct: from the descriptions, however, which are given, it is quite evident that they relate to one and the same species, as Fischer, in his *Synopsis Mammalium*, considers them to be. The title *frontalis*, therefore, must be retained by right of priority over *gaveus*.

Duvaucel, who hunted this animal at the foot of the Silhet Mountains, describes it as very wild, but easily domesticated. He says, that until he had opportunities of seeing it in a natural state, he entertained the opinion that

it did not differ essentially from our domestic ox, his impression having been received from an inspection of specimens living tame in the menagerie at Barrackpore. Subsequently, he regarded it as distinct.

THE GOUR.

According to Captain Rogers, the *Bos* gour is found in several of the mountain districts of Central India, but chiefly in Myn Pât, or Mine Paut, a high insulated mountain, with a tabular summit, in the province of Sergojah, in South Bahar. "This table-land is about thirty-six miles in length, by twenty-four or twenty-five miles in breadth, and rises above the neighbouring plains, probably, two thousand feet. The sides of the mountain slope with considerable steepness, and are furrowed by streams that water narrow valleys, the verdant banks of which are the favourite haunts of gours. On being disturbed, they retreat into the thick jungles of saul-trees, which cover the sides of the whole range. The south-east side of the mountain presents an extensive mural precipice, from twenty to forty feet high. The rugged slopes, at its foot, are covered by impenetrable green jungle, and abound with dens formed of fallen blocks of rocks, the suitable retreat of tigers, bears, and hyænas. The western slopes are less rugged, but the soil is parched, and the forest seems withered by excess of heat. The summit of the mountain presents a mixture of opens, lawns, and woods. There were once twenty-five villages on Myn Pât, but these have been long deserted on account of the number and ferocity of the beasts of prey. On this mountain, however, the gour maintains his seat. The Indians assert that even the tiger has no chance in combat with a full-grown gour, though he may occasionally succeed in carrying off an unprotected calf. The wild buffalo abounds in the plains below the mountains; but he so much dreads the gour, according to the natives, that he rarely attempts to invade his haunts, and the hunting-party only met three or four urnas (arnees) on the mountain. The forests which shield the gour, abound, however, with hog-deer (Sambur-deer), saumers, and porcupines." In these wild and romantic retreats, Capt. Rogers and his party hunted the gour, which, when wounded, turns round upon its adversary, ready to do battle. A short bellow, imitated by the syllables *ugh-ugh*, was the only cry which the animal was heard to utter, and that not until it had been struck by the bullet. The gour is gregarious, herding together in parties varying from ten to twenty; browsing on the leaves and shoots of tender trees and shrubs, and also grazing on the banks of the streams. In cold weather the saul-forests are their places of concealment, and the heats bring them out to feed on the green lawns and valleys. They do not, it seems, wallow in swamp and mire like the buffalo. If the natives are to be credited, this animal will not brook captivity; and, even when captured at an early age, the mountain-calf droops and dies. The period of gestation is stated to be twelve months; the females produce their young in August. The native name of the bull-calf, for the first year, is Purórah; of the cow-calf, Paréeah. The full-grown cow is termed Goúrin.

The gour attains to a very large size. Dr. Traill gives the dimensions of one not fully grown, which measured, from the nose to the end of the tail, nearly twelve feet, and stood nearly six feet high at the withers. The limbs are vigorous, clean-made, and more deer-like than bovine. The back is strongly arched; and, when the animal stands still, the line from the nose to the base of the tail, along the spine, presents a nearly uniform curve. This appearance is partly owing to the curved form of the chaffron, and, still more, to a remarkable ridge of no great thickness, which rises six or seven inches above the general line of the back, from the last of the cervical to the middle of the dorsal vertebræ, where it gradully declines and becomes lost. This elevation is very conspicuous in gours of all ages, although they may be loaded with fat, and has no resemblance to the hunch found on the withers of the zebu breed. There is not a trace of the dewlap, which is well marked in the gayâl. The hair of the skin generally is short and sleek, having somewhat the oily appearance of a fresh seal-skin. The colour is deep brownish black, almost approaching to bluish black. Between the horns is a tuft of curling, dirty-white hair; and over each hoof is a ring of the same colour. The animal, altogether, has a striking appearance.

THE YAK OF TARTARY.

We may here briefly notice a species of the bovine race, the Yak of Tartary (*Bos grunnies*), too remarkable to be altogether omitted in our sketch of the ox tribe. Whether the yak belongs to the restricted genus *Bos* is very doubtful. In some points it certainly is related to the musk ox (*Ovibos*), at least if we are to judge from the skins, more or less imperfect, which we have had opportunities of examining. The following is the description of a skin wanting the horns and limbs, in the Zoological Museum:—The nostrils are narrow, converging below, with a small nude space between them, and a thin naked border round them, so that there is no true broad naked muzzle, as in the common ox. The ears are small and pointed, and the forehead is covered with black, curling locks; but its degree of convexity cannot be accurately determined, owing to the absence of the skull. The back is clothed with smooth hair, of a deep chocolate brown, a white stripe occupying the ridge of the withers, and another the centre of the croup. From the shoulders, sides, and under surface of the body, and also from the inside of the thighs, hangs a pendent mane of long hair, falling in huge masses, so as to cover the limbs, and almost touch the ground. This mane is grizzled black, except a central line along the belly, of pure white. The tail is tufted with a huge mass of glossy white and rather coarse hairs, from eighteen to twenty inches in length. In size, the animal could not have exceeded the small Scotch breed of cattle. On the authority of Gmelin and Turner, the horns are round, small, pointed, and bent in a semicircle forwards. The withers are elevated, and the colour is said to vary. We have known an instance in which the tail was black.

The yak is a native of the mountains of Tibet, and, when wild, is said to be savage and dangerous. It is, however, reclaimed, and a domestic breed is kept by the natives of the range tenanted by the animal in its wild condition. It is, perhaps, the Poephagus described by Ælian. From an early period, its tail was used as a standard by the Mongols and Tartars, being one of the distinguished insignia of superior officers. In India these tails are mounted on ivory or silver handles, and, under the name of chowries, are used to brush away the flies. Elephants of state are taught to carry a splendidly mounted chowrie in their proboscis, and wave it backwards and forwards.

Of the habits of the yak, in a state of freedom, little or nothing is known. As regards the domestic yak, Turner, in his *Account of an Embassy to China*, after giving a description of it, observes, that "these cattle, though not large-boned, seem, from the profuse quantity of hair with which they are provided, to be of great bulk. They have a downcast, heavy look, and appear, what indeed they are, sullen and suspicious, discovering much impatience at the near approach of strangers. They do not *low* loud, like the cattle of England, any more than those of Hindostan, but make a low grunting noise, scarcely audible; and this but seldom, when under some impression of uneasiness. These cattle are pastured in the coldest parts of Tibet, upon the short herbage peculiar to the mountains and bleak plains. The chain of mountains, situated between the latitudes 27° and 28°, which divides Tibet from Bootan, and the summits of which are mostly clothed with snow, is their favourite haunt. In this vicinity the southern glens afford them food and shelter during the severity of the winter. In milder seasons the northern aspect is more congenial to their nature, and admits a wider range. They are a very valuable property to the tribes of itinerant Tartars called Duckba, who live in tents, and tend them from place to place, and to whom they afford an easy mode of conveyance, a good covering, and wholesome subsistence. They are never employed in agriculture, but are extremely useful as animals of burden, for they are strong, sure-footed, and carry a great weight. Tents and ropes are manufactured of their hair; and, amongst the humbler class of herdsmen, I have seen caps and jackets made of their skins. The best requital with which the care of their keepers is at length rewarded, for selecting them good pastures, is in the abundant quantity of rich milk which they yield, and in the butter produced from it, which is most excellent. It is the custom of the Tartars to preserve this in skins or bladders, and, the air being thus excluded from it, it will keep in this cold climate throughout the year; so that, after some time tending their herds, when a sufficient

store is accumulated, it remains only to load their cattle, and drive them to a proper market with their own produce, which constitutes, to the utmost verge of Tartary, a most material article of commerce."

THE ANOA.

Genus Anoa.—This rare animal has been considered by some naturalists as belonging to the antelopes; and, by others, to the Ox tribe. The uncertainty here arises from the circumstance, that though the animal has been noticed for many years, only a few fragments of skulls and horns have hitherto been brought to Europe. The horns are erect, perfectly straight, and in the plane of the forehead. They are about the same length as the head that is, about nine or ten inches; strongly depressed or flattened in front; of nearly the same breadth till within three inches of the extremities, whence they are rather attenuated to the tips, which are bluntly pointed, and irregularly wrinkled, or rather crumbled, through out the greater part of their length. The head is long and narrow, terminating in a broad muzzle.

Mr. Pennant is the first naturalist who has mentioned the anoa, but he has given no account of its characters, and merely relates, that it is about the size of a middling sheep, is wild and fierce, and resides in large herds among the rocky mountains of the island of Celebes. He considers it as a small species of wild buffalo, and adds, that it is captured only with great difficulty; and is so fierce in confinement, that some of them, belonging to Governor Loten, in one night, ripped up the bellies of fourteen stags which were kept in the same paddock with them. The next author who mentions the anoa, from original documents or personal observation, is Colonel Hamilton Smith, who, in the fourth volume of Griffith's translation of the *Règne Animal*, describes the head and horns, and considers the animal as a species of antelope. Colonel Smith's fragment was brought from Celebes by the late Dr. Clarke Abel, who obtained it on his return from China, in the suite of Lord Amherst; but, since that period, various other heads have been brought to Europe, some of which are deposited in the British Museum, and in the rooms of the Zoological Society.

THE ARNEE, OR URNA.

Genus bubalus.—This is the *Bos arni* of Shaw and other naturalists; and is, by some, regarded as nothing more than the wild ordinary buffalo. It may, however, be found to be a distinct species, if a judgment were to be formed by the characters of the horns, which are not uncommon in museums, though no specimen of the animal itself exists in Europe. It tenants the high lands of Hindostan; and is known in Bengal, and the neighbouring provinces, by the name of Arna. It is described as a large and formidable beast, conspicuous for strength, courage, and ferocity. The horns are remarkable for their enormous size, often measuring from four to six feet in length. They rise upwards, first inclining outwards and backwards, and then, arching gradually towards each other, as they proceed to the points, form together a bold crescent. They are compressed on their anterior and posterior surfaces, and rough, with numerous tranverse furrows and ridges. The chaffron is narrow and convex.

THE COMMON BUFFALO.

The *Bos bubalus* (Buffalo) has long been domesticated in India, where its services, as a beast of draught and burden, render it extremely valuable. From India it has spread into Egypt, Greece, Italy, and Spain. In its form and general aspect, it differs materially from the ox, being a heavier and more clumsy, as well as a more powerful animal. Though lower in stature than the bull, it is more massive in the body, which is supported on short, thick, solid limbs. The hide is coarse and dense, covered rather sparingly with black wiry hair. The head is large, and carried with the muzzle projecting. The forehead is convex, and the muzzle wide. The horns are compressed, and lie back, turning up laterally, and often attaining to a great size; but the direction seldom allows the points to be used for goring. The ears are large and pendulous, and the dewlap is small. The eyes are wild, savage, and malicious in expression; whilst the tail is long and slender.

In its native regions, the buffalo is a formidable animal, and capable of contending with the tiger, which is often foiled in the deadly

strife. When excited, it rushes desperately on its foe, strikes him down with the horns or forehead, kneels upon him, crushing-in his chest, and then tramples on the lifeless body, as if to satiate its vindictive fury. Its natural temper, indeed, renders it difficult to tame, and difficult to manage; while its prodigious strength and adaptation for certain localities, render it a valuable acquisition. The hot morass, teeming with pestilence, is the genial abode of this animal; and its delight is to wallow in the stagnant water, where it will luxuriate for hours during the heat of the day, with its black muzzle just elevated above the surface. Its flesh is hard and unsavoury; but the milk of the buffalo-cow is of peculiar richness; and, in the East, a considerable quantity of butter is procured from it. The hide is greatly esteemed for its solidity and toughness. Colonel Sykes states that the long-horned variety of the buffalo is bred in great numbers in the Mawals, or hilly tracts along the Ghauts. In those tracts much rice is planted; and the male buffalo, from his superior hardihood, is much better suited to resist the effects of the heavy rains, and the splashy cultivation of the crops, than the bullock. The female is also infinitely more valuable than the common cow, from the very much greater quantity of milk she yields.

Dillon states that the buffalo at Malabar is larger than the ox, with white eyes, flat horns, often two feet long, and thick and short legs. "It is an ugly animal, almost destitute of hair; goes slowly, but carries very heavy burdens. Herds may be seen, as of common cows; and they afford milk, which serves to make butter and cheese; their flesh is good, though less delicate than that of the ox: the animal swims perfectly well, and traverses the broadest rivers. Besides the tame ones, there are wild buffaloes, which are extremely dangerous, tearing men to pieces, or crushing them with a single blow of the head. They are less to be dreaded in the woods than elsewhere, because their horns often catch in the branches, and give time to the persons pursued to escape by flight. The skin of these animals serves for an infinity of purposes; and even cruses are made of them for holding water or liquors: the animals on the coast of Malabar are almost all wild, and strangers are not prevented from hunting them for their flesh." In Ceylon, as in Malabar, the buffalo exists both in a wild and domesticated state; and the tame herds are not unfrequently joined by wild individuals, which the inhabitants sometimes entrap, and at other times shoot. It would appear that the animal is more common in Bombay than in Bengal. At Boitpoor, Bishop Heber was shown a white buffalo, probably an albino, which was pointed out by the Indians as a rare curiosity. From India the buffalo is distributed throughout Siam, Cochin-China, Malacca, and the adjacent islands, as Sumatra, Java, Borneo, &c., together with the Philippines. It is also common in China, where it is used in the various labours of agriculture. In Africa it is abundant along the Nile, and in other districts, existing in a wild or emancipated state, as well as in a state of domestication. In Abyssinia, more particularly in the forests of Ras el Fil, the buffalo is very common. Its skin is chiefly employed in that country for the making of shields, in which considerable art is displayed. In the middle ages the buffalo was introduced into Spain and Italy, where, in course of time, the animal became naturalised; and, in some districts, may be regarded as in a state of nature.

In the worst parts of the pestilential tract, known as the Maremma in Italy, the savage buffalo may be seen, roaming at will, under the care of wild keepers (buffalari), whose lives are passed in this dangerous employment. Wherever large herds of buffaloes occur, it may be taken as the sure index of malaria. In the wild provinces of the Calabrias, where most of the plains and valleys are always partially swamped by the Laino, the Chratis, the Amato, and numerous other rivers and torrents, they are very common. They range, almost the only occupants, over the plains of Pæstum, and the still wilder and more extensive flats of Apulia. The Pontine Marshes offer them a favourite retreat; and in the pestilential Maremma, both of Rome and Tuscany, scarcely any other animals, except wild boars, are ever seen. In Northern Italy, where there is infinitely less malaria than in the south, they occur in greater numbers, as there the causes of that pest exist, and there its effects are often felt, in the inundated rice-grounds of Lombardy, in the marshes formed by the overflowing

of the Po, the Tanaro, the Ticino, or of some other rivers or lakes. In every part of Italy, but especially in the south, buffaloes are used as beasts of burden, and their strength and perseverance render them available in many emergencies when oxen or horses would fail. In some of the marshy plains of Calabria, communication would be almost impracticable were it not for the buffalo. There are not only morasses, swamps, and bogs in every direction, but rivers, suddenly swollen to torrents in rainy weather, and unprovided with bridges of any sort, frequently occur. Here horses, mules, or oxen are useless; but a pair of good buffaloes, working chest-deep in the mud, will, slowly indeed, but surely, drag a large *carro*, with its goods or passengers, through them. Yoked to a high cart, with wheels of prodigious diameter, they will fearlessly take to the swollen torrent, and, provided the water does not entirely cover them, drag it safely to the opposite bank. On the great plain of Apulia the buffalo is the ordinary beast of draught; and, at the annual fair, held at Foggia at the end of May, immense droves of almost wild buffaloes are brought to the town for sale. Fearful accidents occasionally happen, enraged animals breaking from the dense mass in spite of all the exertions of the buffalari, and rushing upon some object of their vengeance, whom they strike down and trample to death. It is dangerous to over-work or irritate the buffalo; and instances are known in which, when released by the brutal driver from the cart, they have turned instantly upon him, and killed him before any assistance could be rendered.

The buffalo, as well as the bull, is baited in the amphitheatres of Italy. One kind of sport with the buffalo is called *La Botta*. A large tube, made of wicker-work or other flexible materials, well wadded without and within, and open at both ends—looking, in short, like a cask or butt (whence its name)—with the ends stove in, is rolled across the arena. Presently a man creeps into this botta, and then, lifting it up on end, rises on his feet and begins to move, with his head peeping above the cask towards the buffalo; which, at first, stares, bewildered at the sight, and then runs and upsets the novel object. In this game the man must be careful, when the charge is made, to draw in his head and legs, and keep himself entirely covered, like a tortoise in its shell. The buffalo, seeing that the botta no longer moves, kicks it, butts at it for a while, causing it to roll along, and then leaves it; but presently the cask is again raised on end, and moved by the man towards the beast. This trick could not be played with the Toro Vaccino, the sharp and strong horns of which, being better placed for attack than the buffalo's, would pierce the cask through and through. The attack of the buffalo in the arena is more dangerous than that of the bull; and, in his rage, when he has missed his tormentor, he often strikes the wall furiously with his head and horns, making fragments of stone fly in all directions, apparently without suffering any injury from the violence of the shock.

THE CAPE BUFFALO.

This ferocious animal (*Bos Caffer*) is a native of Southern Africa, associating generally in troops, and frequenting the watered glens and ravines among the hills. Like the common buffalo, it delights to wallow in pools or swamps, where it sometimes passes the greater part of the day. Its temper is depicted in its lowering eye, and the malevolent expression of the countenance, to which the position of the horns overshadowing its fiery optics, not a little contributes. These weapons form at their base a solid rugged mass, covering the forehead, from which they bend downwards, and somewhat outwards, gradually diminishing to the points, which suddenly take an upward curve. The distance between the points of the horns is frequently five feet; but the rugose, massive base of each is in contact, forming an impenetrable helmet. Their colour is black. The ears are a foot in length, pendent, and, in a great measure, defended by the horns; yet it is observed that they are always torn and jagged, either from the wounds received in their combats with each other, or from the laceration of thorns and spines, the animals continually forcing their way through the dense thickets. Though not taller than an ordinary ox, the Cape buffalo is a far stouter, heavier, and more powerful beast. Its limbs are short and thick; its body bulky, and its head ponderous. The hide is thick and tough, and sparingly covered with harsh blackish hairs; those on the under lip, and about the corners of the mouth, being

elongated, so as to form a scanty beard. Considering the massive proportions of this fierce tenant of the wilds of Southern Africa, it possesses no inconsiderable share of fleetness; and when pursued by the hunter, it tears through the thicket and up the mountain-side with surprising impetuosity. Not unfrequently, however, it returns to the attack; so that it is not to be encountered without the utmost caution, and the means of escape at hand. Many are the fatal accidents, and the narrow escapes from death, recorded by the various travellers who have penetrated the country of the Cape buffalo. The bellowing of the animal, when wounded—his fury, as he tears up the earth with his horns, and his efforts to revenge himself upon his foes, before he sinks expiring, are described as terrific.

It is the general opinion of the natives of South Africa, that though the lion frequently attacks the buffalo, he cannot overcome it by dint of strength, but has recourse to stratagem, lying in ambush near some stream where the beast comes to drink. They say that the lion springs upon its back, drives his tremendous claws into the nape of the neck, and the sides of his victim, tearing and mangling the buffalo till it falls and dies. At other times, they affirm that the lion darts suddenly upon the buffalo, fastens on its chest and neck, lacerating and squeezing the mouth and nose with his fore paws, till, half suffocated, and exhausted by vain efforts and loss of blood from deep wounds, it expires. The lion, however, does not always make these attacks with impunity, for his carcass is sometimes found gored and trampled, evidently by buffaloes, the herd having come to the rescue of their companion. An allied species, the *Bos Pegasus* of H. Smith, is found in Western Africa.

THE AUROCHS, OR ZUBR.

The genus *Bison*, *Bison Europæus* (*Bos urus* of Gmelin), is a noble species, existing in the great forest of Bialowicza (pronounced Bealawezha in Poland), in Lithuania, where it is protected by stringent laws. In proportions, the auroch is robust, and its withers are massive and elevated. The largest males stand about six feet high at the shoulders. The hair is of two sorts: one is soft, woolly, and short, covering the whole trunk and limbs; the other is long and rough, covering the upper part and sides of the head, the neck, and shoulders, where it forms a mane; under the lower jaw, and along the throat to the chest, it is lengthened into a sort of beard. In old bulls the mane is often a foot in length, and is thickest in November. The eyes are small, but fierce and sparkling when the animal is irritated. The tongue, lips, and palate are blue. The tail, which is short, is furnished with a tuft of stiff hairs at its extremity. An odour, described as between that of musk and violets, is exhaled from the skin; especially from that part of the skin covering the convexity of the forehead. It is stronger in the male than the female, and may be perceived at the distance of a hundred yards from the herd. The flesh of this animal is highly esteemed; but, when roasted, is said to have a bluish tinge. Its voice is a deep, short grunt, which can be heard at a considerable distance.

Thickets, near the swampy banks of rivers, are the favourite resorts of the aurochs; but in summer, and during the warmer portion of autumn, according to Dr. Weissenborn, the herds select sandy spots. In winter, they keep quiet by day in the thickest part of the fir-wood, only browsing by night, and finding sustenance in the bark of young trees. In spring, they visit spots where the herbaceous plants they relish begin to sprout. They are fond of tree lichens. "The strength," says Dr. Weissenborn, "of the zubr is enormous, and trees of five or six inches in diameter cannot withstand the thrusts of old bulls. It is neither afraid of the wolf nor bear, and assails its enemies both with its horns and hoofs. An old zubr is a match for four wolves. Packs of the latter animal, however, sometimes hunt down even old bulls when alone; but a herd of zubrs has nothing to fear from any rapacious animal. Notwithstanding the great bulk of its body, it can run very swiftly. In galloping, its hoofs are raised above its head, which it carries very low. It has, however, but little bottom, and seldom runs farther than one or two English miles. It swims with great agility, and is very fond of bathing. In its habits it is exceedingly shy, and avoids the sight of man. It can only be approached from the leeward, as its sense of smell is extremely acute. But when accidentally and

suddenly fallen in with, it will passionately assail the intruder. In such fits of passion, the animal thrusts out its tongue repeatedly; lashes its sides with its tail; and its reddened and sparkling eyes project from their sockets, and roll furiously. Such is its innate wildness, that none of the species has ever been completely tamed. When taken young, it becomes, it is true, accustomed to its keepers; but the approach of other persons renders it furious; and even its keepers must be careful always to wear the same sort of dress, when going near it. Its great antipathy to the *Bos Taurus*, which it either avoids or kills, would render its domestication, if it were practicable, but little desirable. The experiments made with a view of obtaining a mixed breed from the zubr and *Bos Taurus*, have all failed, and are now strictly prohibited."

THE AMERICAN BISON.

The *Bison Americanus*, or American Bison, was formerly more extensively diffused than at present; still it exists in vast numbers in Louisiana, roaming over the prairies, which are watered by the Arkansas, Platte, Missouri, and upper branches of the Saskatchewan and Peace rivers. Like its congener, the auroch, the American bison is of powerful frame, and exceeds, in bulk, the ordinary race of cattle; its height at the fore quarters being upwards of six feet, and its weight from twelve to fifteen hundredweight, and sometimes much more. The head is huge, ponderous, and carried low; the withers are massive and elevated; the eyes are small, and their expression is ferocious; and the horns are small and black. The neck, withers, and chest are covered with a profusion of long shaggy hair, contributing to render the appearance of the animal wild and terrific. The hind quarters are clothed with shorter wool. The general colour is umber brown, acquiring a rusty tint in winter. Endowed with the sense of smell in great perfection, wary, and fierce, the bison associates in large herds, conducted by one or two old bulls, whose motions the rest appear to follow; but herds of bulls also live separately. Their food consists of grass and rank herbage; to obtain which, in winter, they scrape away the snow with their feet. On the approach of an enemy, the herd immediately takes to flight; but if one be wounded, the life of the hunter is placed in great jeopardy; for, turning in a moment, it rushes on its assailant with headlong impetuosity, and with determined resolution. Several fatal instances might be cited in which the hunter has perished from want of caution in attacking this formidable beast, and many hairbreadth escapes are on record. In defending itself from a dog, the bison strikes violently with its fore feet, and easily keeps its annoying foe at bay. Its flesh is accounted excellent; the tongue and hump, or flesh on the top of the withers, being especial delicacies. The chase of the bison is, therefore, assiduously pursued, both by natives and Europeans. It swims well; and during the heats of summer, vast herds make their way to shady rivulets, streams, and pools, in which they delight to plunge and bathe. Herds of twenty thousand, crossing rivers upwards of a mile in breadth, have been seen, as Lewis and Clarke inform us; or darkening the plains on their passage to fresh feeding-grounds.

Salt-springs, or saline morasses, or salt-lakes, are great attractions to this animal, and, at all seasons, are visited by numerous herds. These, however, are incessantly thinned by the hunters; and the time is probably not far distant, when the American bison will be as rare and as limited in its extent of range as the aurochs of Lithuania. At certain seasons of the year, the bulls engage in terrible conflicts, and rush furiously upon man, or any other animal which ventures near them. With the exception of man, the most formidable enemy against which the bison has to contend, is the huge grisly bear; and before this dreaded monster the strongest bull goes down. The bison will breed with the ordinary race of domestic cattle, against which the auroch displays the greatest antipathy; though, in one respect, the latter approaches nearer to the common ox than does the bison. We allude to the number of ribs, which are thirteen in the ox on each side, fourteen in the aurochs, and fifteen in the bison.

THE MUSK OX.

Genus Ovibus—the *Ovibos Moschatus*. The characters of the genus *Ovibos*, as exhibited by the only known species, are defined by the horns being expanded at their base, forming a helmet-like mass, covering the forehead, where

their edges are in contact with each other. From this mass they emerge, round and tapering, first bending down between the eye and ear, and then sweeping suddenly upwards. The ears and tail are short; the eyes moderate; the nostrils oblong, and inclined to each other from above downwards. There is no true naked muzzle; but a very narrow nude line surrounds each nostril, the rest being covered with hair. There is no furrow in the upper lip.

The musk ox is a native of the high latitudes of North America, ranging from the sixty-first to the seventy-fifth degree of latitude. In size it scarcely equals the smallest of the Highland breed of cattle; but appears larger than it really is, from the profusion of long, matted, woolly hair with which it is covered, and which hangs on each side almost to the ground, nearly concealing the limbs to the pasterns. The tail is entirely hidden. Beneath the lower jaw, throat, and chest, the hair flows full, long, and mane-like. The general colour is dull, grizzled umber brown, darker on the sides and under surface. On the centre of the back is a brownish-white mark or saddle. The districts inhabited by the musk ox, says Dr. Richardson, are the proper lands of the Esquimaux; and their name for it is Ooming-mak. It frequents wild and rocky situations, mostly destitute of wood; feeding on grass during one season of the year, and on lichens during the other. When fat, its flesh is tolerable; but, at certain times, both that of the bulls and cows smell strongly of musk. Though the limbs of the musk ox are short, they are very vigorous, and the animal is fleet and active. Dr. Richardson mentions one pursued on the banks of the Coppermine, which scaled a lofty sand-cliff, so steep, that the party were obliged to descend to their hands and knees, in order to crawl up the acclivity.

In September, these animals assemble in herds, and are then much harassed by the hunters. The sport, however, is not free from danger, for the bulls are very irascible, and, when wounded, will dart furiously upon the hunter, who requires both practice and presence of mind in order to escape. If, however, the hunters remain concealed when they fire upon a herd of musk oxen, the poor animals mistake the noise for thunder, and forming themselves into a group, crowd nearer and nearer together as their companions fall around them; but should they discover their enemies by sight, or by their sense of smell, which is very acute, the whole herd seek for safety by instant flight. Their wool is very fine; and some stockings which were made from it in France, are said to have been equal to those made from silk. If it could be obtained in sufficient quantity, it might doubtless be employed advantageously as an article for manufacture.

BRITISH WILD CATTLE

The wild cattle of this country are kept in their native purity in the park of Lord Tankerville, at Chillingham, in Northumberland. A few are also kept in Scotland, in a park of the Duke of Hamilton's, at Chatelherault, in Lanarkshire; but the latter have a less certain pedigree. The former nobleman, in a communication to the Society of Arts, gives a very interesting account of their characteristics and habits, and assigns them the palm of being the aboriginal cattle of the island. That the original breed in this country, or at least some early breed of cattle, have been very large in size, is evident from the fossil bones found in bogs; yet a smaller kind has been discovered in Cornwall, with a species of horn more resembling the cattle of the Duke of Hamilton. Fitzstephen, who flourished in the twelfth century, alludes to the wild bull of the woods as having its haunts in the large forests near London. Guy, Earl of Warwick, whose contest with the Wild Dun Cow is commemorated by the animal's skull being still preserved in Warwick Castle, doubtless had an encounter with a monstrous animal of the wild breed. Hollinshed also speaks of Bruce being, in the fourteenth century, nearly killed by a bull in the forest of Caledon; and from his attendant having rescued him, the well-known name of "*Turnbull*" originated. So recently as the sixteenth century, it seems, these wild cattle were common in the Callender or Calder woods. Conrad Gesner describes them, in the quaint legend-language of the day, as "white oxen, maned about the neck like a lion. * * * * This beast is so hateful and fearful of mankind, that it will not feed of that grasse, or those hearbes whereof he savoureth

a man hath touched—no, not for many days together; and if, by art or policy, they happen to be taken alive, they will die with very sudden grief. If they meet a man, presently they make force at him, fearing neither dogs, spears, nor other weapons."

CATTLE OF THE MAREMMA.

We have already alluded to the Maremma of Italy; to which we must return, to notice an uncouth, savage, wild breed of cattle, which inhabit its marshes. This piece of country consists of a flat strip, except in a few places where hills intervene, extending from the mountains of Genoa to the extremity of Calabria, a length of about seven hundred miles. Its breadth is from the base of the lower range of the Apennine chain to the shore of the Mediterranean. This sweep of country is pestilential in the extreme in summer; and though it yields the most luxuriant harvests, is only partially cultivated, the greater portion being left for pasture. Here, besides the cattle used as beasts of burden, or draught, and employed in the work of the farms, large herds roam unmolested under the care of keepers, which, together with the buffalo-keepers, before alluded to, and forest-rangers, are the only stationary population in the wild Maremma. The former, as wild and savage as the animals under their charge, are always mounted on fleet horses, and armed with a long lance, which they use in driving the cattle, and in defending themselves against the fierce bulls, which, as well as the buffaloes, are extremely dangerous. These men are often criminals, who have fled from justice into the Maremma, where they are obliged to sojourn, and where they are often employed by the proprietors of the farms and cattle, as rangers or drivers. Those who are not fugitives adopt their occupation from choice, which, dangerous and laborious as it is, is one of independence and freedom. They are the analogues of the Arab of the desert, or the Gauchos of the Pampas. Besides being paid for their services, they rear cattle of their own. In the summer months they retire to the shady forests along the sea-shore, where the air is not so unwholesome as in the open plains. The cattle are collected at various times, and driven by these men, called Vaccari, to the fairs held in the towns, for sale.

Both the bull and the buffalo are baited in Italy by men and dogs, for the entertainment of the Roman people, who seem to be as fond of such scenes as were their great predecessors. The scene of the sport, which is called La Giostra, is, like many other buildings in Rome, a curious compound of the modern and the ancient. The Amfiteatro Correa, as the place is designated, is situated in a massive cluster of buildings raised upon the site, and partly with the materials, of the mausoleum of the Emperor Augustus, in the Campus Martius. The walls of this amphitheatre, and the seats, are all of modern structure. The arena occupies the platform of the ancient mausoleum, which, in other times, was cultivated with flowers and rare shrubs; while the pyramid, that bore the statue of Octavius, rose in the midst. The vaults beneath, which once held the ashes of the Cæsars, are now in part used as dens for the wild cattle that are brought in from the Campagna, and other places, to be baited. Twice every week, during the summer, do these exhibitions take place; commencing at five in the evening, and lasting till dusk. The men who are to encounter the bulls and buffaloes are called Giostratori. They are dressed in white, with a red sash round the waist. Each bears a short staff, with a red pennon at the end of it; and they muster in the arena, make their bows to the assembled spectators, and wait the onset of the mighty animal. Among them are generally two or three of great reputation for skill; these are usually vaccari (herdsmen), or buffaleri (buffalo-keepers)—men brought up from their childhood among the cattle they respectively manage, and familiarised with their habits. The Giostratori, from Viterbo, have the reputation of excelling all others; and hence the term *Il Viterbese* (the Viterbonian) is used metonymically to designate any celebrated bull-fighter. In the centre of the arena is a strong post firmly fixed, by dodging round which a man may, for a considerable time, evade the assaults of a bull or buffalo. At a given signal, the door of a den is opened, and the bull rushes forth, wildly gazing around him, till, observing the Giostratori, with their scarlet sashes and pennons, he singles out one, and roaring and lashing his tail, drives furiously towards him. The man nimbly avoids the charge; others

come to the rescue, drawing off the bull's attention from him, and inviting its attack; till the enraged animal, distracted by the number, quickness, and manœuvres of his antagonists, and wearied with vain efforts, ceases the pursuit. The den is then thrown open, and he generally retires of his own accord, as if glad to escape. When the bull, as is sometimes the case, perseveringly follows a man, and presses him hard, he catches hold of one of the iron rings, placed at certain distances round the wall enclosing the arena; and, by a rapid movement, springs to the top, which, like a terrace, runs round the foot of the lower seats of the amphitheatre. The height of this parapet is six or seven feet; and it requires great agility, strength, and presence of mind, as well as precision, to avoid being pinned to the wall in the act of taking the leap. Such accidents sometimes happen; but when the Giostratori see one of their number thus endangered, they use every means to divert the bull's attention. The bull (and also the buffalo) is, on some occasions, baited with fierce dogs of the Corsican breed, resembling our bull-dog, and distinguished by the same "tenacity of tooth" and indomitable courage. These dogs usually pin the bull by the nose or lip; but are very frequently tossed in the air, or ripped up by the sharp horns of the maddened animal. At these exhibitions, strange to say, females are among the spectators, and not less interested than the rougher sex. Some of the bulls procured in the Campagna of Rome are very noble and spirited animals, of fine figure and great strength.

CATTLE OF SPAIN AND PORTUGAL.

In Spain and Portugal, where extensive wilds and forest lands afford ample pasturage, large herds of oxen, born in freedom, wander uncontrolled and untroubled, excepting by man, from whom they flee with precipitation, till roused to fury by his assaults, when they attack in turn, and bear upon him with resistless impetuosity. It is from these herds that the Spaniards and Portuguese select the fiercest and boldest for the revolting contests of the arena; while others are tamed, and broken-in for the ordinary purposes of husbandry. It is easy to imagine the excitement produced by the chase and capture of a herd of these fierce brutes, and the danger to man and horse. Such sport frequently takes place in the great forest of Alemtejo, where an eye-witness of one thus describes it:—"I had received," he says, "intimation that the village of Alcoxete, on the Tagus, was to be the scene of a bull-fight, and that the villagers, for many miles, were invited to join in the hunt, which was to take place the following day. I accordingly crossed the river in the company of about twenty persons, each being provided with a long pole, having a small spike fixed in one end, and mounted as inclination or ability suited. When we arrived at the opposite bank, a little before daybreak, we found about 250 or 300 persons assembled, some mounted on different sorts of quadrupeds—from the noble Andalusian horse to the humble donkey; and many were on foot. All were armed in a similar manner to ourselves. We divided into two parties—one stretching in a long line to the right, the other to the left. We had not advanced far, in this manner, when we fell-in with a herd of cattle, having twelve bulls with it; which no sooner descried us, than they bounded off with the speed of lightning. The sport had now begun. We put our horses to the utmost speed, threading our way among the tall pine-trees as well as we could, and endeavouring by wild cries to drive the bulls towards the other party. At length, after about an hour's chase, some half-dozen of us, who were better mounted than the rest, came up with them, and commenced the attack with our long poles. The manner was this:—One person, riding at full speed, gave the bull nearest him a sharp prick with the goad, which it no sooner felt, than it turned upon its assailant and gave chase; another horseman then coming up, attacked it on the other side, when, leaving the first assailant, it turned upon the second; he, in like manner, was rescued by a third, and so on. The attention of the infuriated animal was thus so distracted as to prevent his escape, and give time for the other hunters to come up. The bulls were thus at length separated from the herd; and a sufficient number of persons having arrived to form a circle round them, we commenced operations for the purpose of driving them towards the town. All the skill of the riders was now necessary, and all the activity possessed by both man and

horse, to keep clear from the pointed horns which were presented against him, as well as to prevent the herd from breaking through the living net with which it was surrounded. This was, perhaps, the most difficult part, and was attained by keeping each bull separately engaged, and thus preventing united action; for what line was sufficient to resist the simultaneous rush of these powerful animals? The continued exertion had knocked up many of the horses which had started in the morning, and the circle became smaller and smaller as the day advanced; several persons, indeed, had been carried off, severely wounded by the horns and feet of the bulls. Redoubling our efforts, however, we at length, about four o'clock in the afternoon, succeeded in driving them into an inclosure, where a number of oxen (all at one time wild) were quietly grazing. Here they were kept till required for the next day's sport." These bulls were baited in the square of Alcoxete, converted into a temporary arena; and afterwards reduced to a complete state of servitude. The picadores, or men who encountered them, were on foot, and only armed with short darts, and displayed the most surprising courage and address; and when at last they were to be thrown, a man, leaping between the horns, there supported himself till the cords were lashed round the animal's limbs.

The bull-fights, as conducted in the amphitheatres of Spain and Portugal—the lingering relics of those contests in which Rome so much delighted, and which prevailed more or less throughout the Roman empire—have been often described. These sanguinary spectacles are the delight of the Spanish people, and are not only tolerated, but encouraged by the higher classes of both sexes, who find a morbid gratification in the torments which the bull endures from the lance of the cavalier, or the horse from the horns of the bull. The most graphic and spirited description of this "ungentle sport," is that by Lord Byron, in *Childe Harold's Pilgrimage*, canto i.; attached to which there is a note by Sir J. C. Hobhouse, which further describes the scene:—"The magistrate presides; and after the horsemen and picadores have fought the bull, the matadore steps forward and bows to him for permission to kill the animal. If the bull has done his duty by killing two or three horses, or a man (which last is rare), the people interfere with shouts, the ladies wave their handkerchiefs, and the animal is saved. The wounds and death of the horses are accompanied with the loudest acclamations, and many gestures of delight, especially from the female portion of the audience, including those of the gentlest blood." Of the effects of such exhibitions on the character of the people, nothing need be said; whatever atrocities may be committed by men, "nurtured in blood betimes," cannot surprise us.

CATTLE OF RUSSIA.

Within the Arctic Circle the ox gives place to the reindeer; but in Iceland, cattle are reared in great numbers, and are valuable. In size and appearance, excepting that they are seldom horned, they resemble the breeds of the Scottish islands. It would appear that the Icelandish farmers conduct the breeding of their stock on no principles; consequently, there is great room for improvement: nevertheless, the cattle, on the whole, are handsome, and the cows yield a considerable quantity of milk. In Norway and Sweden, cattle are numerous, and also in Russia. From this last country, the main exports to England consist of tallow and hides. In that extensive empire vast numbers are reared, principally in the southern provinces; and the markets of St. Petersburg, and other towns, are supplied with cattle sent from distant parts of the country. The herdsmen live in a state of barbaric simplicity, and are nomadic in their habits. They travel with their herds to Moscow, St. Petersburg, and other places, which depend more upon them for a supply than upon the farmers of the adjacent districts. The following passage, in Johnston's *Russia*, conveys a just idea of the Russian cattle-keeper and his herd:—"Along the road," he says, "we passed one or two large droves of horned cattle proceeding to St. Petersburg. We learned that they were brought from the provinces south of Moscow. These cattle are all of a whitish colour, well made, and of about seven hundredweight. Their journey to St. Petersburg occupies three months; they travel from eight to sixteen miles through the night, and are allowed to pasture and rest, during the

day, on the sides of the road. The herds are attended by one or two men, who convey their cooking utensils, baggage, &c., in a waggon drawn by two oxen; and while their numerous herds repose undisturbed under the shade of the delicate birch, they stretch themselves on the ground, and pass their time in a true Scythian state. Here are also seen a few sheep, but of an inferior breed, covered with hair somewhat like that of a goat. This country is not favourable for the pasture of sheep, owing to the coarseness of the grass, and the abundance of wood. Little or no attention seems to be paid to the rearing of any other animal besides the horse. To him alone the Russ devotes his whole attention, and from him he derives his livelihood."

CATTLE OF MOLDAVIA AND WALLACHIA.

In Moldavia and Wallachia cattle are abundant; in the former district, indeed, the people continue, in a great measure, their ancient nomadic habits, making use of the services of the ox as a beast of draught or burden. United in immense caravans, they roam over a vast extent of territory, transporting, in tall vehicles of singular construction, various articles of produce, provisions, and other things, to the towns scattered at long distances about the wide plains of Moldavia. Day by day they move cheerfully on, to the slow and measured sound of the footsteps of their oxen, and are often an entire month without seeing a single human habitation. At the approach of evening the caravan halts; the numerous waggons are disposed in the form of a square, and the oxen are turned out to graze at large, under the watchful care of intrepid dogs which accompany the caravan. In the middle of the square a fire is now lighted, at which the conductor prepares his simple repast, and afterwards disposes himself to sleep, sheltered by a warm and heavy coverlid, which completely enwraps him. These indefatigable walkers are no less excellent riders. They possess a fine race of horses, which are employed for drawing lighter vehicles; while the heavier waggons are drawn by the slow oxen. There are no high roads in Moldavia; the plain is open, and each traveller chooses his own track; and it is often with difficulty that the oxen can drag their way through heavy ground. Storms of wind, rain, or snow make the matter worse, so that a passage can only be achieved by great patience, labour, and resolution. A bullock-caravan of Moldavia, wending its weary way over the vast plains of that province, while lighter vehicles, drawn by swift horses, are seen in the distance, furnishes an interesting picture for the artist of rural life. It is by these caravans that the trade and commerce of Moldavia are carried on, and the town supplied with grain.

CATTLE OF SWITZERLAND.

In Switzerland there is an excellent breed of cattle; and in no country are these animals more carefully attended to, or held in greater esteem for their utility, as far as the dairy is concerned. Travellers have frequently noticed their docility and intelligence, which they have, at the same time, not a little exaggerated. It is customary to hang bells round the necks of the cattle, sheep, and goats, in order that, if they stray among the hills and mountains, the herdsmen may be directed by the sound in his pursuit of them, the slightest tinkle being heard at a great distance in those lofty and quiet regions. The cows selected to bear the bell become accustomed to it from habit, and often, we doubt not, betray signs of uneasiness when deprived of it; but the account given by some writers, respecting their feelings, borders on the ludicrous. "The cow, whose superior beauty, sagacity, or good conduct seems to entitle her to be the leader of the herd, is always, on gala days, distinguished by the largest and finest-toned bell, and the bravest ornamental collar, and so down through all the gradations of good, to the small appendage that marks the indifferently good or clever animal, and the total absence of ornament and distinction which points out the self-willed or vicious. If any cow has been guilty of straying, of unseemly behaviour, breach of discipline, or any vicious trick, the displeasure of the Vacher is not testified by blows, but by the temporary deprivation of her bell; and this seldom fails to reduce her to order, and prevent a repetition of the offence. It is only necessary to see the cow on a gala day, with her badge of distinction strapped round her neck, and then to see her deprived of it for some reason or other, to be convinced that

this is true. She is now gay, good-humoured and frolicsome; then sulky and gloomy."

The pastoral economy of Switzerland, which is common to Savoy and other Alpine countries, and the annual progress of the shepherds and cowherds, with their flocks and cattle to and from the mountains, are interesting. The richer proprietors and breeders in the Alps, possess tracks of pasturages, and sometimes houses, at different heights. In winter they live at the foot of the mountain, in some sheltered valley; but this they quit in the spring, and ascend gradually, as the heat brings out vegetation on the higher lands. In autumn they descend, by the same gradations, to the valley. Those who are less rich have a resource in certain common pastures, to which they send a number of cows proportionate to their means of keeping them during the winter. Eight days after the cows have been driven up to these common pastures, all their owners assemble, and the quantity of milk each cow produces, is accurately weighed. This operation of weighing is repeated one day in the middle of summer, and again at the end of the season. The milk of all the cows has, in the meanwhile, been put together, and made into butter and cheese; and this common product is divided into shares, according to the quantity of milk each owner's cows yielded on the days of trial. In some parts, and more particularly in the retired parts of the forest cantons, the peasants make use of the Alp-horn for the purpose of collecting their herds. This primitive instrument is a tube of wood about five feet in length, of very simple construction. It produces a deep, mellow, and prolonged note, resounding to a great distance, floating over the upland pastures, and echoing from crag to crag, and from rock to rock. On hearing the well-known summons, which is regularly given at sunset, the cattle bestir themselves, and wend their way to the châlet, where the peasants are waiting their arrival. The deep note of the Alp-horn, heard among the mountains, and multiplied by echoes till the last tone dies away, produces a pleasing impression on the traveller, which he long remembers.

CATTLE OF SOUTH AFRICA.

The ox, in South Africa, is used as a beast of burthen and draught; and his services are of the utmost importance. Waggons drawn by oxen, often cruelly overtasked, are the ordinary travelling vehicles of this part of Africa, and are admirably adapted for the country, which is rugged and mountainous, and generally destitute of any other roads than the rude tracks originally struck across the wilderness by the first European adventurers. Each waggon, provided with a canvas tilt, to protect the traveller from sun and rain, is drawn by a team of six, eight, or even twelve oxen, fastened with wooden frames to a strong central trace, or trek-tow, formed of twisted thongs of bullock's hide. The driver, who sits in front, has a whip of enormous length, which he often uses with unsparing severity. Formerly, if the account given by Barrow is to be credited, the treatment exercised by the Dutch-African boors to their oxen was brutal in the extreme. The Dutch boors, moreover, made use of very large and clumsy waggons, and delighted in transporting tremendous loads at a time. It was a common sight to see six, eight, ten, or even a dozen pair of oxen yoked to an enormous vehicle; but even this number was inadequate to such burthens as they had to draw, and the resistance of such roads. The most disgraceful cruelties were used to force these poor creatures on their way. Their drivers cut them with knives; and when, worn out, they laid themselves down, and refused to rise, it was a common practice to light fires under their sides, and so force them to go. One of these brutal boors, whose knife had been often employed on the flesh of his cattle, boasted that he could start his team at full gallop by merely whetting that knife on the side of his waggon. Once, as he was exhibiting this experiment, the waggon was overturned, and one of the company—"unfortunately not the proprietor," says Mr. Barrow—"had his leg broken."

When the Dutch took possession of the Cape of Good Hope, they found the Hottentots a pastoral people, possessed of flocks and herds. The oxen were of large size, with horns that swept forwards and upwards to a great length; and they were not only trained for riding, but even as guardians of the flocks and cattle, and as instruments of destruction in battle. The Hottentots, says Kolben—who visited them

while they yet retained their name and independence as a nation—"have oxen which they use with success in battle. They call them Bake-leys. Every army is provided with a large troop of these war oxen, which permit themselves to be governed without trouble, and which their leader lets loose at the appointed moment. The instant they are set free, they throw themselves with impetuosity on the opposing army; strike with their horns, kick with their heels, overthrow, rip up, and trample beneath their feet, with frightful ferocity, all that opposes them. They plunge with fury into the midst of the ranks, and thus prepare for their masters an easy victory. The manner in which these oxen are trained and disciplined, certainly does great honour to the talent of these people."

Le Vaillant, when in South Africa, says that he saw some of these oxen, which were then only used by certain tribes of Hottentots; but he gives the same account of their mode of fighting as Kolben, who, also, describes the bake-leys as guardians of their flocks. "When out in the pasture-grounds, at the least sign of their conductors, they will hasten to bring back the cattle which are straying at a distance, and keep them herded together. They rush on strangers with fury, whence they are of great service against the Boschmen, or robbers, who may attempt to plunder the flocks. Each kraal has, at least, half-a-dozen of these bake-leys, which are chosen from among the most spirited oxen. On the death of one, or when one, in consequence of old age, becomes unserviceable—in which case its owner kills it—another ox is selected from the herd to succeed it. The choice is referred to one of the old men of the kraal, who is thought to be most capable of discerning that which will most easily receive instruction. They associate this noviciate ox with one of long experience, and he is taught to follow his companion, either by beating or some other method. During the night they are tied together by the horns; and they are, also, thus kept tied during the greater part of the day, until the learner has become a good guardian of the flock. These guardians know all the inhabitants of the kraal—men, women, and children; and testify the same respect towards them that a dog displays towards all those that live in the house of his master. There is, therefore, no inhabitant of the kraal who may not with safety approach the flocks. The bake-leys never do them the least injury; but if a stranger, and particularly a European, should offer to take the same liberty, without being accompanied by some Hottentot, he would be in great danger from these guardians of the flock, which usually feed round it, and which would come upon him full gallop. Then, unless he be within hearing of the shepherds, or have fire-arms or good legs, or unless a tree be near in which to climb, he is sure to be killed. It would be useless for him to have recourse to sticks or stones; a bake-ley has no fear of such feeble weapons." Sparrman was one of the last South African travellers who found the Hottentots in their original state of pastoral freedom. He mentions a woman, who was possessed of sixty milch-cows; and, on the cattle of the kraal being brought home from pasture, the evening was enlivened by singing and dancing.

The Caffres, Corannas, and other tribes, have oxen in abundance, which are employed as beasts of burden. The Corannas are a nomade race, frequently removing with their flocks and herds to fresh pasture-land, and transporting their mats, tents, and utensils strapped on the back of oxen, which also carry themselves and their wives and children:—

> "Fast by his wild resounding river
> The listless Coran lingers ever;
> Still drives his heifers forth to feed,
> Sooth'd by the gorrah's humming reed;
> A rover still, uncheck'd, will range,
> As humour calls or seasons change;
> His tent of mats and leathern gear
> All packed upon the patient steer."

Burchell, another South African traveller, describes the saddle-oxen as generally broken for riding when not more than a year old. The first ceremony is that of piercing the nose to receive the bridle; for which purpose they are thrown on their back, and a slit is made through the septum, or cartilage between the nostrils, large enough to admit a finger. In this hole is thrust a strong stick stripped of its bark, and having, at one end, a forked branch to prevent its passing through. To each end of it is fastened a thong of hide, of a length sufficient to reach round the neck, and form the reins;

and a sheep-skin, with the wool on, placed across the back, together with another, folded up, and bound on with a rein long enough to pass several times round the body, constitutes the saddle. To this is sometimes added a pair of stirrups, consisting only of a thong, with a loop at each end, slung across the saddle. Frequently the loops are distended by a piece of wood, to form an easier rest for the foot. While the animal's nose is still sore, it is mounted and put in training, and, in a week or two, is generally rendered sufficiently obedient to its rider. The facility and adroitness with which the Hottentots manage the ox, have often excited admiration. It is made to walk, trot, or gallop at the will of its master; and, being longer-legged, and rather more lightly made than the ox in England, travels with greater ease and expedition, walking three or four miles in an hour, trotting five, and galloping, on an emergency, seven or eight.

In some parts of Central Africa the ox is employed in like manner. Major Denham gives an account of its use in the central countries which he visited:—"The beasts of burden," he observes, "are the bullock and the ass. A very fine breed of the latter are found in the Mandara valleys. Strangers, and chiefs in the service of the sheikh, or sultan, alone possess camels. The bullock is the bearer of all the grain and other articles to and from the markets. A small saddle, of plaited rushes, is laid on him, when sacks, made of goat-skins, and filled with corn, are lashed on his broad and able back. A leathern thong is passed through the cartilage of his nose, and serves as a bridle; while, on the top of the load, is mounted the owner, his wife, or his slave. Sometimes the daughter or wife of a rich Shouaa will be mounted on her particular bullock, and precede the loaded animals, extravagantly adorned with amber, silver rings, coral, and all sorts of finery; her hair streaming with fat; a black rim of kohal, at least an inch wide, round each of her eyes; and, I may say, arrayed for conquest at the crowded market. Carpet and robes are then spread on her clumsy palfrey; she sits *jambe de ça, jambe de là*, and guides her animal by the nose. Notwithstanding the peaceableness of his nature, her vanity still enables her to torture him into something like caperings and curvetings."

CATTLE OF SOUTH AMERICA.

The ox was one of the first of the domestic animals carried over to America by the early Spanish settlers; and there it has multiplied and spread, and indeed, in some degree, recovered its original independence. Herds of wild oxen roam the Pampas, where they are hunted and slain for their hides, which form an important article of commerce. These wild herds are, in some districts, exceedingly numerous, differing in no respect from their domestic relatives, and rendered tame without much difficulty. According to Azara, "Captain John de Salazar, born in the city of Pomar in Aragon, transported, from Andalusia, seven cows and a bull to the coast of Brazil; thence he conducted them overland to the river Paraña, at the place opposite to where it receives the river Mondai. He there constructed a raft; placed the cattle on it, and gave them in charge to a certain Gaëté, whilst he, himself, went by land to Paraguay. Gaëté descended the Paraña, to its union with the river of Paraguay, and, steering up this, he safely arrived at the city of Assumption in 1546. He spent many months in this voyage; and as he had only one cow given him for payment, the saying has hence arisen, in allusion to the great value of anything—'It is dearer than Gaëté's cow.' The second founders of Buenos Ayres took, in 1580, some cows from Paraguay, which multiplied in the neighbourhood; and, from want of due care, many of them became wild, and bent their course towards Rio Negro. The Indians of the Cordillera of Chili became acquainted with these animals, which had already attained their boundaries; and they commenced to carry from them herds of tamed cattle to Chili, where the presidents of this settlement purchased them from these Indians. Those Indians, who could not live in their country without some resource, established themselves in the plains which were occupied by these cattle, and some even mixed with the Pampas' Indians. In the meantime, the Indians, who were unsubdued, destroyed the cattle to the south of Buenos Ayres. The Spaniards of those parts, however, did not neglect to take a portion, which they conducted to Cordova and Mendoza; whilst the Spaniards of Buenos Ayres made up entire cargoes of the hides of bulls and cows; for, at

that time, the animal itself was not considered of value, its skin being all that was sought after. The result of all this was, that, towards the middle of the century, wild cattle no longer existed in the Pampas; and the unsubdued Indians saw themselves under the necessity of stealing the domestic animals, or of making incursions into the estancias of the Pampas. This was the commencement and cause of the bloody war which the Spaniards had with the Indians. The herds of these revolted or wild cattle, which are also called orcillards in the plains of Monte Video, do not pass to the north of the southern establishments of the Guaranis' Missions. The following is the account which I have collected of their origin:—The city authorities of Buenos Ayres, in the name of certain of its inhabitants, as is proved by its archives, made, at the commencement of the century, contracts, on the one part, with the English, for the acquisition of Negroes; and, on the other part, with certain Spaniards, who were thus authorised to procure the hides of the animals on the plains situate to the north of the Rio de la Plata, on payment to the city of a certain tax, of which the sum total was shared between these Spanish inhabitants, who, from this circumstance, were called Actionnaires. The primitive source of this right, or this proceeding, is not known; but certain it is that all the inhabitants did not participate in it, and that its produce was the exclusive share of these Actionnaires, who were the descendants of the earliest of the original settlers. Such is the origin of the horned cattle of these countries, where they prodigiously multiplied. About eight hundred thousand ox-hides are annually exported from Buenos Ayres and Monte Video to Europe." Mr. Darwin states, "that, from the latter place, the annual exportation is three hundred thousand; and the home consumption, from waste, very considerable. In order to obtain these hides, some horsemen join together, and arrange themselves in two ranks which form an angle. They then press on the two sides a small number of cattle; and one of the horsemen, who goes last in the angle, hamstrings the animals with a knife, in the shape of a crescent or half-moon, fastened at the end of a staff. While this goes on, the horsemen continue to ride forwards; and when they have thus secured a sufficient number of animals, they retrace their steps; and the person who hamstrung them gives each beast thus maimed a finishing stroke with a sharp spear, and the horsemen dismount to strip the carcass, sometimes of the fat and suet, but always of the skin: this they do with such dexterity, that some men, without assistance, will strip twenty-six cattle at a day's work. When a single head of cattle is to be killed for the sake of its flesh, a horseman throws a lasso over its horns or neck, and another does the same over one of its feet; then straining in opposite directions, they prevent it from struggling free, and so strangle it. Admirable is the dexterity with which, when the animals pass as they rush forwards, the lasso is thrown, so that, directed backwards under its feet, the animal, at the pleasure of the horseman, is entangled either by one foot or by two together." It is a singular feature in the history of the New World, that so many of our domestic animals there imported, should have returned to their primitive independence: the ox, the horse, the hog, the ass, the rabbit, the cat, and the dog, have thus estranged themselves from the control of man. Individuals have, at different times, escaped from confinement, or been neglected: a vast region lay before them, presenting abundance of food; they multiplied, and their offspring in turn; and thus, within a brief period, have the plains of the New World been peopled by alien races of animals, which claim Asia or Europe as their starting-point.

CATTLE IN THE ISLANDS OF THE SOUTH PACIFIC OCEAN

America is not the only portion of the globe to which, by the agency of man, in modern times, the ox has been introduced. We allude to Australia, New Zealand, and the groups of islands which sprinkle the Pacific Ocean. "With the appearance of Vancouver," says Otho von Kotzebue, speaking of the Sandwich Islands, "arose the fortunate star of these islands. Among the innumerable benefits he conferred upon them, they are indebted to him for the possession of sheep and cattle. Tameamea (the native king) declared these animals under a tabu for ten years, which allowed time for so large an increase, that they now run wild in the forests." Of the benefits resulting from the introduction of

the ox into a country naturally destitute of it, nothing need be said; but the gift of cattle to a people who, though yet uncivilised, are still capable of appreciating their value, is to commence a revolution in their state and condition, immeasurably for the better: for the possession of property is one of the bonds of society; and the desire of acquiring it, the great stimulus to industry. With the introduction of the ox, the condition of the people of these islands has necessarily been improved. Not only has cattle been reared for home consumption, but for supplying the ships that navigate these seas (whalers, &c.), other valuables being given in exchange. Hence has the rearing of cattle been generally undertaken. This, of course, involves care and attention, and a state of peace: but agriculture and commerce follow, and prepare the way for the arts of civilised life.

CHAPTER II.

BRITISH BREEDS OF CATTLE.

THE WILD WHITE CATTLE OF CHILLINGHAM PARK.

(*Bos Taurus*, var. *Scoticus*). Having merely alluded to this beautiful breed of cattle, we will here resume the subject, and lay before the reader a few interesting details respecting its history.

Mr. Youatt, in his admirable work on cattle, in the *Library of Useful Knowledge*, clearly expresses his belief in the identity of this wild breed with our domestic races; and adds, that the slightest observation will convince us, that the cattle in Devon, Sussex, Wales, and Scotland, are essentially the same breed changed by soil and climate, yet little changed by the intermeddling of man. "Every one who has had opportunities of comparing the Devon cattle with the wild breed of Chatelherault Park, or Chillingham Castle, has been struck with the great resemblance in many points, notwithstanding the difference in colour." In another place, the same writer says—"To the Principality we naturally look for some trace of the native breed of cattle, for the Welsh were never entirely subdued by any of the early invaders. The Romans possessed merely a portion of the country; the Saxons scarcely penetrated into Wales, or not beyond the county of Monmouth. The Welsh long resisted the superior power of the English under the Norman king; and it was not till late in the thirteenth century that the Principality was annexed to the crown of England. We therefore expect to find more decided specimens of the native productions of our own islands; nor are we altogether disappointed. Howell Dha, or Howell the Good, describes some of the cattle in the tenth century as being white, with red ears, resembling the wild cattle of Chillingham Castle. An early record speaks of a hundred white cows, with red ears, being demanded as a compensation for certain offences against the princes both of North and South Wales. If the cattle were of a dark or black colour, a hundred and fifty were to be presented. When the Cambrian princes did homage to the king of England, the same number of cattle, and of the same description, were rendered in acknowledgment of sovereignty. Speed tells us, that Maud de Breos, in order to appease King John, whom her husband had offended, sent to his queen a present, from Brecknockshire, of four hundred cows and a bull, all white, with red ears. Whether this was the usual colour of the ancient breed of Welsh and British cattle, or a rare variety esteemed on account of its beauty, and chiefly preserved in the parks of the nobles, we are unable to determine. The latter is the most probable supposition; and the same records that describe the white cattle with red ears, speak also of the dark or black

coloured breed which now exists, and which is general throughout the Principality." As a further point, in favour of the probability of the white wild cattle being specifically the same as our domestic races, we select the following quotation from the work before referred to:—"The colours of the improved short-horns are red or white, or a mixture of the two, combining in endless variety, and producing, very frequently, a most brilliant effect. The white, it is very probable, they obtained from an early cross with the wild breed; and whenever this colour shows itself, it is accompanied, more or less, with a red tinge on the extremity of the ear—a distinctive character also of the wild cattle."

Are, then, the wild cattle of Chatelherault Park, Lanarkshire, or Chillingham Park, Limehall, Cheshire, and other places, the descendants, as Mr. Youatt seems to infer, of these white cattle of ancient race, so valued in early times? or are they descendants of the wild breed which, at an early period, tenanted the great forests of our island; and which, as the forests became cleared, and the land cultivated, were gradually thinned, till, at length, their remnant found, in the chase or park of the nobleman, that safety which, as old denizens of the soil, they might well claim; and but for which, the breed would long since have been utterly extirpated? Again, was the wild breed which roamed the Caledonian forest, and the great forest north of London, so late as the latter part of the twelfth century, and mentioned by Fitzstephen, identical with the white Cambrian breed? These are questions more easily asked than solved. One thing is certain—the wild cattle of Chillingham will breed with the domestic race; but the progeny has never been preserved, the calves having been always killed at an early age, from a pardonable desire to keep this ancient race in all its purity. We firmly believe, however, that the cross breed would be as fertile as any of our domestic varieties.

The author of the article "Bos," in the *British Cyclopædia*, is of opinion that the white cattle in question are domesticated oxen which have run wild; and, moreover, that they are not descended from an aboriginal stock, but that the race was originally imported by the ecclesiastics from Italy, where herds of wild cattle, much resembling them, still exist. In this, as in all other theories, authenticated facts, as our basis, are wanting. The Chillingham wild cattle are invariably of a creamy-white colour, with a black muzzle; the whole of the inside of the ears, and the tip externally, are red; the horns are white, with black tips; very fine, and bent upwards. Some of the bulls have a thin upright mane, an inch and a-half, or two inches long. The weight of the oxen is from thirty-five to forty-five stone the four quarters (fourteen pounds to the stone); that of the cows, from twenty-five to thirty-five stone. The beef is finely marbled, and of excellent flavour. These cattle are fleet and active. "At the first appearance of any person they set off at full gallop; and, at the distance of about two hundred yards, make a wheel round, and come boldly up again, tossing their heads in a menacing manner; on a sudden they make a full stop, at the distance of forty or fifty yards, looking wildly at the object of their surprise; but, upon the least motion being made, they all again turn round and fly off with equal speed, but not to the same distance, forming a shorter circle; and, again returning with a bolder and more threatening aspect than before, they approach much nearer—probably within thirty yards—when they again make another stand, and then fly off. This they do several times, shortening their distance, and advancing nearer and nearer, till they come within such a short distance, that most people think it proper to leave them, not choosing to provoke them further." The females hide their calves for a week or ten days, after birth, in some sequestered situation, and visit them two or three times a day. If any person approach the calves, they crouch close, like a hare in form, and endeavour to hide themselves; but, when roused, exhibit great fury, pawing, bellowing, and butting at the intruder. The females are resolute in the defence of their young, and attack persons discovered near their lair with impetuous ferocity. Formerly the hunting of these animals was conducted with great parade, many scores assembling on horseback, and hundreds on foot, to witness the sport; but, from the number of accidents that happened, and, perhaps, from the disturbance created among the game, this practice has been long discon-

tinued. The keeper now uses a rifle, and steals upon the animal selected, until within range, and drops it at a single shot.

ENGLISH DOMESTIC CATTLE.

(*Bos Taurus*). To describe the form, contour, and colour of the domestic ox is superfluous; and it is generally known that, within the precincts of our fertile island, affording unequalled pasturage, the animal has ramified into many breeds, which it has been the care of the farmer to improve and modify to his own advantage. Excepting in a few districts, the ox is not employed in our country as a beast of draught, or for the labour of the plough, as it was, in ancient times, on the continent, and still is in many countries. On the contrary, it is for its flesh on the one hand, and for the milk of the cow on the other, that this animal is so valuable. Indeed, everywhere the true importance of the ox is in itself, and not its labour; though, in many parts of the world, it is used both as a beast of burden and draught. Restricting our present observations to British cattle, we may observe, that there are two parties immediately, and, we may say, professionally, interested in the culture of cattle—the grazier and the dairy farmer; and both require different, and, to a certain degree, incompatible excellences. With the grazier, roundness of form, a moderate smallness of bone, depth of chest, and an aptitude to acquire external fat upon a small consumption of food, are among the points of excellence aimed at and expected. On the contrary, the supply of a large quantity of rich milk, is the desideratum of the dairy farmer; and it very seldom happens that the qualities prized by the one party, are combined with those required by the other. Both, therefore, attend to their exclusive interests, agreeing only in the care bestowed upon the animal subservient to their respective purposes. To note every variety, and enter into minutiæ—the part rather of the farmer than the naturalist—is far from being our object; a sketch, however, of some of the principal breeds will not be uninteresting, and must necessarily find a considerable space in a work of this kind.

OLD BREEDS.

Among the older breeds was a long-horned race, now greatly modified, of which Lancashire and the West Riding of Yorkshire might be considered as the central district; whence it extended—not to the exclusion of other races—through the midland counties, and even into Ireland. This breed was termed the Craven, from a district of that name in Yorkshire, bordering upon Lancashire, where it is said to have originally appeared. It was large, coarse-boned, and apt to be long in the body, which, besides, was destitute of roundness. The milk, if not abundant in quantity, was extremely rich, and suited the purpose of the dairy farmer. The horns were of enormous length; sometimes they projected horizontally on each side of the head; generally, however, they swept downwards, with an inward flexure, often reaching below the level of the muzzle, or even meeting before it, so as to interfere with the facility of grazing. Indeed, the points often press against the sides of the muzzle, rendering it necessary to shorten them. In the beginning of the eighteenth century, various agriculturists commenced a series of attempts towards the improvement of this old breed, which resulted in the establishment of the Dishley, or new Leicester long-horn. To the grazier the improvement was most immediately beneficial, but the dairyman preferred the old stock. In process of time, however, the new breed extended, improving the cattle of the middle and northern counties, and especially of Ireland. In its turn, however, this breed has almost everywhere yielded to a middle or short-horned race; and even in Leicestershire, the stronghold of the Dishley breed, few are now to be seen. In Cheshire also—which, till recently, retained a long-horned breed, derived chiefly from the old Lancashire and new Dishley stocks—the Durham or short-horned race has made decided inroads, but with doubtful advantage as respects the quality of the cheese for which that county is celebrated.

THE LEICESTERSHIRE BREED.

The old long-horned breed of this county was endeavoured to be improved by Mr. Bakewell, who here prosecuted his experiments; and, although he was successful in removing the coarseness which characterised these animals, and increased their fattening capabilities, he failed in either improving or establishing

their dairy qualities. The breed, therefore, upon which he exercised his talent, is held in little estimation by those whose object is to obtain large quantities of milk, and who prefer the bigger and coarser animals, the milk-produce of which is both large and good, leaving the others as best adapted for the purposes of the grazier. In Leicestershire, cheese is the grand object of the dairyman. Consequently, abundant milk-yielding cows are the most profitable for him; and some of these will give about 400 pounds of cheese, and as many gallons of milk in the year, after allowing the seven weeks, during which the cow is supposed to be dry. In some of the districts of this county, cows are kept for six, seven, or even eight years, if they continue to produce largely. Cheese being the grand stock-in-trade of the Leicestershire farmer, it is much more profitable to him to maintain a plentifully-producing cow, than to get a few pounds, more or less, by her when she is disposed of. The grass of Leicestershire being extremely rich, the farmer, on a large scale, is enabled to fatten his cattle when he pleases, and to sell such as he might dispose of for the dairy. As old cows, therefore, are not expected to be very good grazers, he does not look for wonders from them; and, should he succeed in putting a moderate degree of fat upon their bones, he is contented with a lower price per stone for their beef than would be taken for better animals. The cows will only make what is called cow-beef—suitable only for the coarse palates of a ship's crew, or for "provisioning the navy."

THE KERRY BREED.

This is a hardy breed, and celebrated in Ireland as the cottier's dairy cow. Her characters are—fine head and legs, flat shoulders, breast and quarters, small tail, and skinny udder. She is a famous milker, and has a timid, gentle look, indicative of great patience, which is further shown by the meekness of her deportment. Like the poorer classes of the countrymen to whom she belongs, she is extremely hardy, and will live where other kinds of cattle would starve. Her yield of milk is not only abundant, but rich, and it is produced from the hardest and coarsest sorts of cattle-food. On account of the excellent quality of both her milk and butter, she is an invaluable possession.

THE CHESHIRE BREED.

This breed is becoming rapidly extinct. The old breed of Cheshire was a long-horned variety; but the dairy system, introduced into the vicinity of large towns by the growth of their populations, has brought the short-horn cow of Yorkshire into competition with the native breeds. The *quantity*, rather than the quality, of the milk they produce, has been with them the great object of consideration; consequently, the character of the Cheshire cheese has been deteriorated in the markets. Another reason why the short-horned cattle have risen higher in estimation in this county than in others, is the care which is taken to prevent their exposure to atmospheric changes, and also to the enriching of exhausted grass-lands by manuring them with bone-dust. This sort of manure so improves these lands as to give great advantage to an animal requiring a good quality, as well as a fair quantity, of provender, both of which are requisite for the short-horns. Mr. Palin, in his *Prize Essay on the Farming of Cheshire*, observes—"Doubts, I believe, exist in the minds of some intelligent farmers, whether any improvement has been effected in the milking properties of dairy cows, as regards quality, by the introduction of the improved short-horns amongst them. That the latter breed is much disposed to fatten, is admitted; but this class of cattle does not stand very high in public estimation as milkers. It may, therefore, be reasonably supposed that there are good grounds for thinking that it is very possible to introduce too much of the improved short-horn blood into the dairy stocks, and that great caution should be taken in crossing. However this may be, I am of opinion that an improvement may be effected by the introduction of the blood *to a certain extent;* care being always taken to select male animals intended to be reared from the best milkers."

THE DORSETSHIRE BREED.

It is to be expected that, in most dairy districts, a large milk-producing animal will take precedence of one which may have a more beautiful form, or be a better taker-on of fat. This is the case in Dorsetshire; and hence, an ill-formed, and somewhat coarse breed of cattle prevails throughout the county. They belong

to the long-horned breed; are chiefly of a rufous colour; large size, with flat chests and buttocks. Crosses with the Hereford, Devon, and Ayrshire breeds, have been endeavoured to be obtained from them, but without success. One Alderney, however, has been introduced to a dairy, for every ten or twelve of the native breed; and this has been found greatly to increase the quantity of cream, as well as to improve the quality of the butter.

Crosses, or breeds more or less distinct, prevail in every dairy district of this county; but it is unnecessary to specify them here, as it would only be merely a repetition of the same thing over and over again. There are other breeds, however, of a more specific character which merit our attention.

THE SHROPSHIRE BREED.

Among the long-horned race must be reckoned the old Shropshire breed—a large-boned and hardy race, well fitted to serve the dairy. It would appear that this breed is seldom to be seen pure, having been crossed with advantage by the short-horned Holderness. In Staffordshire, the old long-horned breed has been, in most parts, superseded by short-horned cattle. It still, however, maintains its ground in the north of that county, more particularly along the banks of the Trent and the Dove, close to the borders of Derbyshire. Between the long-horned and the short-horned races of our cattle, intervenes a race termed "middle-horns," represented by the North Devonshire, Somersetshire, Herefordshire, Gloucestershire, and Sussex cattle.

THE DEVONSHIRE BREED.

This breed is of great antiquity, and has been long celebrated for beauty. Like most of our other breeds, it has become improved during the last fifty or sixty years, and has, perhaps, now attained to its perfection. The head of the Devon ox is small, but broad across the forehead, and narrow at the muzzle; the horns curve gracefully upwards; the chest is deep, and the back straight. The cow is small, compared with the bull. Thus, then, physiologically speaking, the breed is well formed, and it is of very long standing. In disposition the whole race is docile and tractable, gentle and patient; whilst they are very hardy, considering the mild and humid nature of the climate in which they subsist. They are not, however, very famous for their milk-producing qualities; nor, if early fat is the grazier's object, are they very extraordinary feeders. Still they will feed, and attain to a considerable size. At some periods of their growth they produce a class of beef of fair quality. Red, and nothing but red, is a *sine quâ non* in a Devonshire ox. He has a moderately straight top, and a somewhat thin skin, covered with curly hair. The rump is narrower than that of the short-horns, and the crop lighter and flatter; but the brisket is large and full, the legs fine, the shoulder slanting, and the neck long and thin. He is what would be denominated, in the short-horn districts, a "shelly" animal, and cannot be pronounced a good grazer. As a draught animal, however, he stands very high. The cow is not a good milker. A short-horn breeder speaks very prejudicially of this breed. He thus describes the cattle at a fair in Devonshire:—"With the exception of one animal, I did not see a level carcass; but a want of beef in the roasting parts; low and poor loins, coarse shoulders, bad twist (thighs), and a general want of indications of inside proof." Of the beef, when killed, he says—"The meat was actually running about the stall, being nothing more than a mixture of flabby masses, deficient of fineness of texture and quality." Mr. Parkinson, in his invaluable and practical *Treatise on Live Stock*, mentions that a thin hide in the Devons is not quite a recommendation. He gives the weight of some specimens of six-year-old cattle, which weighed some fifty-seven stone, two pounds; but the cows much less. He says of them—"On the whole, they must be allowed to be good cattle for their soils, and particularly where oxen are worked at the plough. When slaughtered, they are a sort of beef that suits the consumption of many customers." Some have supposed that the Devonshire was the original breed of this island—a supposition which others have pronounced simply absurd.

The system of ploughing with oxen is very generally practised in Devonshire; and, where the land is not too heavy, no teams of oxen are superior, if equal, to them in this kind of work. It is, however, to the grazier, that

this breed is more especially valuable, for they will fatten, as we have said, and supply an excellent quality of flesh. Some farmers have found the North Devons to yield even a large produce of milk, so that, in this particular, much may depend on choice of pasturage. In Somersetshire the Devon breed prevails; or at least the original breed has been greatly crossed by the Devon, of which it presents most of the excellences. The Somersetshire cattle are alike valuable for "the pail, the plough, and grazing." The tract of country between Bridgewater and Cross, produces cheese of well-known excellence; the best Cheddar cheese is made either in that tract or the marshes round Glastonbury.

THE HEREFORD BREED.

The Hereford improved breed, with white faces, is valuable as fattening rapidly, and that on inferior food. The flesh is fine-grained, and highly prized in the market; but the cows yield a very scanty portion of milk. In Gloucestershire the Herefords are preferred for the teams, and by graziers for fattening; but the old Gloucester breed for milk. This old breed is of mixed origin, consisting of a race of Welsh descent, supposed to have been crossed by various other breeds; and among them the Alderney. The rich Vale of Berkeley produces the finest Gloucester cheese. The present breed is a middle-horned race, to the improvement of which much attention has been devoted. The success of short-horned breeders has caused a healthy emulation; and the difference between the Hereford cattle now exhibited, and those shown several years back, not only indicates judgment and skill in the breeds, but leads to the conclusion that the breed, in itself, has considerable fattening capabilities. The old Hereford was a deep-brown animal, sometimes with a yellow cast, free from white. An improved breed, however, now occupies the county, in which the prevailing colour is a dark red, with a white face, white belly, and not unfrequently a white back. The skin is less mellow and thicker than that of the short-horn; whilst the hair has neither the mossy softness, nor the graceful curl of the latter. The eye is full and lively; the chest deep and broad; the loins also broad; and the hips well expanded; a level, broad rump, a round barrel, and full crop; full and deep flank, well ribbed home; small bones, with clean and perpendicular thighs. The belly is almost parallel with the back, and the head is small. Colour and symmetry are perhaps the predominant qualifications which secure the high favour of the breeder of this race.

Whilst possessing all these excellences, however, the Hereford breed is destitute of those qualities which tend to produce early maturity and speedy fattening. It takes on flesh of a soft and mottled description on the best parts; gets full in the sirloin, rump, and crop; but it shows its beef all outside; and requires much more *time* to develop its proportions than the short-horned race. In milking qualities the cow is even behind the short-horn; and she must, in general, be three-and-a-half to four years old before she can be fattened with anything like decided success. The breed requires a rich pasture; and its average weight, when fat, does not exceed fifty-five to sixty-five stones. Herefordshire being more a breeding than a feeding county, the cattle are reared there, and sold off at three years old, and transported to the fatter lands of Leicestershire for the purpose of being grazed. Many of them are also sent into Northamptonshire, and other rich grass districts. But, with all their good qualities, it must be admitted that they require from ten to twelve months more to feed than the more favoured short-horn.

Much controversy has been carried on as to the merits of the two breeds—the short-horn and the Hereford. It must be admitted, however, that, while the short-horn has penetrated into the heart of Scotland and the south of England, and into the counties of Gloucester and Norfolk, the Hereford keeps its ground. A valuable breed of middle-horned cattle extends through South Wales; and of this the Glamorganshire variety is highly celebrated. The oxen are readily fattened, and the cows yield a fair quantity of milk.

THE GLOUCESTERSHIRE BREED.

This is more a mixture of the long-horn and middle-horn than any distinctive race—the old Gloucester cow being nearly extinct. The various crosses to which dairy cattle have been subjected, have obliterated all traces of the

original race; but early crosses with the long-horned breed have, to a considerable extent, prevailed. The Devons have also been used as a cross to render them more easy to fatten; and the Durham short-horns have also occasionally been tried; but the poverty of keep, allowed by the Gloucestershire dairymen to their cattle, has greatly tended to deteriorate the breed. The same fate has, in general, attended attempts to cross with the Herefords. Of the successful crosses adopted in this country, there was one made with an ordinary Gloucester bull and an Alderney cow. This obtained richness in the milk; when a Durham bull was selected to increase the tendency to flesh and to size, and to improve the form generally. This gives a stock one-half Durham, while the other half is constituted of one part Gloucester and one-half Alderney. The average yield of an ordinary Gloucester cow may be reckoned at five hundred gallons of milk, yielding about twenty-four stones of single Gloucester cheese; the remainder of the milk being used in the family, and for fattening calves, or pig-feeding, which is largely practised in all dairy districts.

THE SUSSEX BREED.

The breed of cattle in Sussex closely resembles that of Devonshire. According to judges, it is intermediate between the Devon and Hereford; "having the activity of the first, the strength of the second, and the propensity to fatten, and the beautiful fine-grained flesh of both." Its colour is deep chestnut-red, or blood-bay; and a deviation from these colours indicates a cross. In the Weald of Sussex, oxen of this valuable stock are generally used for team-work; and so great is their strength and quickness, that many teams have been known to travel, with heavy loads, fifteen miles a day, for several successive weeks, without distress. The Sussex cow, like the Devon and the Hereford, is very inferior in size to the bull; and though the milk yielded is good, it is of indifferent quantity.

THE DURHAM, OR SHORT-HORN BREED.

The most extensively diffused breed of cattle in our island, and by far the most valuable, is that termed, by way of distinction, the Short-horned. Of this breed England may justly be proud, as it unites, as far as possible, every good quality. The form is admirable; the oxen fatten quickly, and often attain to an enormous weight, and the cows are excellent as milkers. It would appear that Durham, and some parts of Yorkshire, had long possessed a breed of short-horned cattle of large size, and celebrated for the quantity of milk yielded by the cows; but this breed, not only in figure, but in aptitude to fatten, and in the quality of the flesh, required great improvement—other races far excelling it in these points, so important to the grazier. This stock still lingers, and is certainly valuable to the dairy farmer, who might, however, substitute the improved breed for it with advantage. It is about ninety years since the improved stock of this old, but really fine, breed began to be established on the banks of the Tees, owing to the judgment and care of the intelligent breeders of that district. It differs from the old short-horns in possessing a well-developed figure, and a more than ordinary aptitude to acquire fat. The first step of improvement, resulting from the practical knowledge of Mr. Millbank, and other coadjutors, opened the way for the successful exertions of subsequent spirited breeders, who, by pursuing a judicious plan in crossing, have brought the breed to the highest pitch of perfection. Among these crosses, it is supposed that the white wild breed has contributed a share; and to this circumstance is attributed the prevalence of white as a characteristic of the stock. In speaking of this breed, Mr. Milburn says, that these animals are supposed by some to be traced to Holderness; and, according to others, to have been imported from Holstein. From continental Europe they certainly appear to have sprung; and, being successively improved by a variety of breeders, they have ended in that distinct race of animals, extraordinary, beyond all others, for their astonishing propensities to feed. Others, again, refer their origin to a native race of cattle called the Teeswater, because they have, from time immemorial, inhabited the valley which the Tees has formed by its washings-down of the mountain limestone rocks in which it has its origin. These, it is said, being crossed by the Holderness importations, gradually became a new race. The late Mr. Bates traces the short-horns to a breed in the possession of the Aslabys, of

Studley; and the Rev. H. Berry, to an improvement in the East Riding of Yorkshire, by the importation of a breed from Holland by Sir W. St. Quintin, of Scampston. Of these originals of the short-horns, however, it is hardly necessary to say more than this—that a breed, from distant ages, inhabited the valley of the Tees, which, trained and educated to feed, for a vast succession of generations, on its fertile deposits, acquired the habit of speedy fat-forming. In these valleys, where *hay alone* will feed the largest ox, the production of fat would be so far an object, that breeders would always select the best and easiest feeding-animals; and thus the character of the district, through a number of centuries, might easily lay the groundwork of that improvement which the Millbanks, the Greys, the Booths, the Coates, and, above all, the Collings, effected. The description of the qualities of the modern short-horn is thus given by Mr. Dickson, an established authority. After referring to the general symmetry of the frame, and its delicate colour, either deep-red, cream-coloured, white, or delicate roan—the latter, by-the-by, the most fashionable, and, indeed, prevailing colour—he speaks of it as possessing "the mellowest touch, supported on small clean limbs, showing, like those of the greyhound and the race-horse, the union of strength with fineness, and ornamented with a small, lengthy, tapering head, neatly set on a broad, firm, deep neck; furnished with a small muzzle, wide nostrils, prominent, mildly beaming eyes; thin, large, veiny ears, set near the crown of the head, and protected in front with semicircularly-bent, white, or brownish-coloured, short, smooth, pointed horns. All these several parts combine to form a symmetrical harmony, which has never been surpassed, in beauty and sweetness, by any other species of the domesticated ox."

Keeping in mind what has been stated to be the perfection of a fat animal, the same authority, speaking of the short-horn, says—"We have a straight level back from behind the horns to the top of the tail, full buttocks, and a projecting brisket; we have, in short, *the rectangular form:* we have also the level line across the hook-bones (hip), and the level top of the shoulder across the ox, and perpendicular lines down the hind and fore legs on both sides; these constituting *the square form* when the ox is viewed before and behind; and we have straight parallel lines from the sides of the shoulders, along the outmost parts of the ribs, and the sides of the hind quarters; and we have also these lines, connected at their ends by others of shorter and equal length, across the end of the rump and the top of the shoulder; thus constituting the rectangular form of the ox when viewed from above down the back." The weight which many of these animals attain is surprising; whilst the prices which some of them have fetched, and still fetch, is equally astonishing. The Durham ox, a son of Charles Colling's Favourite, weighed 187 stones 2lbs. The Yorkshire ox, bred by Mr. Dunhill, of Newton, near Doncaster, weighed, when killed, 264 stones 13lbs. These are weights of 14lbs. to the stone, and include the wonderful capabilities to make fat and flesh possessed by this extraordinary race of animals. Though there is not, perhaps, another instance on record of any bull selling for so much money as Charles Colling's Comet, which sold for 1,000 guineas (which must be acknowledged to be a great price), yet £500, £600, and as much as £800, are still given for a first-rate short-horn bull. It is not, however, in rapid fattening qualities alone that this species excels; for it is unquestionably the most remarkable for attaining to an early maturity. The short-horns begin to develop their fat-forming powers even when calves. These powers seem to grow with their growth; and when only a year old, they have all the appearance of full-grown cows. This makes them early ready for the market; consequently their feeders, instead of keeping them to three, four, or five years of age, fatten and sell them off at from two to two-and-a-half years. They can thus turn off one-half more, at least, of beef from their farms or their stalls than could possibly be produced with any other breed. Thus they have quick returns, and large amounts of beef for the food-consumer. To accomplish this, however, care and good shelter are requisite. The cow needs nursing, and nourishing diet when young: but she repays all; for she is a cow when another is a calf. The ox is fat when the other is growing. She will purchase a horse before a Devon will buy a saddle. Hence, the short-horn stands the very first on the list of fat-producing breeds.

Among the most successful of improvers of

this breed was Mr. C. Colling, just spoken of; who bred the celebrated Durham ox, the produce of one of the ordinary short-horned cows, and a bull termed Favourite, of noble figure. At five years old, says the excellent author of the work on cattle, "the Durham ox was sold to Mr. Bulmer, of Harmley, near Bedale, for public exhibition, at the price of £140. He was at that time computed to weigh 168 stones of 14lbs.; his live weight being 216 stones: this extraordinary weight did not arise from his superior size, but from the excessive ripeness of all his points." The Durham ox, in a short time, passed into the possession of Mr. J. Day, who travelled with him through the principal parts of England and Scotland, till at Oxford he discolated his hip-bone, when he was obliged to be slaughtered; and, notwithstanding he must have lost considerably during eight weeks of illness, his carcass weighed—the four quarters, 165 stones 12lbs.; tallow, 11 stones 2lbs.; and hide, 10 stones 2lbs. Among the most remarkable of Mr. Colling's experiments in breeding, was that of a cross between the improved short-horns and a polled Galloway cow, which, being interbred with the pure short-horned stock, gave origin to a breed called the *Alloy*—a term, at first, given by way of disparagement, but continued afterwards when the excellences of the breed were acknowledged. Some idea of its value may be formed from the fact, that at a sale of Mr. Colling's cattle, forty-eight animals (cows, bulls, year-old bull-calves, and heifer-calves) realised £7,115 17*s*. Of the Alloy breed, was the stock, or part of the stock, of the late Rev. H. Berry. The figure of the cows was excellent in every respect, and their milking quality is stated to have been by no means of inferior degree.

Among the most celebrated of the short-horned stocks of the present day, that in the possession of the late Lord Althorp, was one of the most distinguished. It was originally derived from the stock of Mr. R. Colling, and no pains were spared in bringing it to the highest excellence. A celebrated bull, belonging to this nobleman, and which is known under the cognomen of Firby, was regarded as a model of the breed. It is a peculiarity in this short-horned race, that the cows are excellent as milkers; and, moreover, that when dried, they fatten rapidly. The oxen, as it is acknowledged, are fit for the butcher at the age of two years; but this tendency to acquire fat renders them indolent workers, and more unfitted for the team than other breeds—a circumstance of little consequence, as cattle which are profitable to the breeder at two years old, and are as ready for the butcher at this age as those of any other breed at three, or even four, ought never to be submitted to the yoke. The bulls, indeed, being extremely docile, may be employed with advantage in many operations going on in every farm—a plan the more advisable as they are apt to acquire too much fat, which moderate labour would tend to diminish.

It must not be supposed that every breed of short-horned cattle is endowed with the qualities characteristic of the improved stock, which render it so valuable. There is, for example, a breed of short-horned cattle in Lincolnshire, with which the Smithfield market was wont to be abundantly supplied; but the cattle of this stock are by no means first-rate animals. The head is not finely modelled; the bone is comparatively large; the limbs high, and the hips wide. In many instances, the stock has been improved by admixture with more highly bred animals, and rendered valuable; but the flesh is not fine-grained. On the whole, these cattle are better adapted for the dairy farmer than the grazier, as the cows yield a fair quantity of milk.

THE YORKSHIRE COW.

This is a short-horned milk-producing breed, of great size, yielding milk in large quantities, and having a considerable aptitude to fatten. On this account it is chosen by the dairymen of populous towns and cities, especially those of London, for the supply of milk for a given period. Fattened on the refuse of the distillers, and such waste materials as large towns usually furnish, it doubly remunerates whatever care and attention the dairyman may bestow upon it. When fat, the Yorkshire cow will weigh from sixty to eighty stones. Her characters are thus given by Mr. Milburn:—"Her head is fine, and somewhat small; there is a serene placidity of eye, which shows a mild and gentle disposition, tending alike to produce fat and milk. The horns are small and white; the muzzle without black spots; the breast deep

and prominent, but that and the shoulders thin; the neck somewhat narrow, but full below the shoulders, and without any loose skin; the barrel somewhat round; the belly capacious; milk-vein large; back perfectly straight; rump wide, and flat as a table; tail small, and set on so that there is almost a straight line from the tail to the head. The prevailing colour is roan, or red and white; and sometimes white, with the tips of the ears red. The thighs are thin; but the legs are straight and rather short. The udder is very large and muscular, projecting forwards, well filled-up behind, and so broad as to give the cow the appearance of a waddle in her walking." Indeed, her qualities are not inappropriately described in some doggerel lines often quoted; and two of the verses we shall venture to give, as most aptly descriptive of the Yorkshire cow:—

"She's broad in her ribs, and long in her rump,
A straight and flat back without ever a hump
She's wide in her hips, and calm in her eyes;
She's fine in her shoulders, and thin in her thighs.

"She's light in her neck, and small in her tail;
She's wide in her breast, and good at the pail;
She's fine in her bone, and silky of skin;
She's a grazier's without, and a butcher's within."

The quantity of milk given by these cows by far exceeds that of any others, though less, perhaps, than that of some others *in proportion to size*. Mr. Milburn says that he has had instances where as much as thirty quarts per day, in summer, have been given. The distended udder has so swollen before calving—"wedged" is the local and technical term—that one was obliged to be milked several days before she calved; and, after calving, had to be milked three times a day, for fear of the consequences of an over-distended udder. Moreover, she gave a large quantity of butter as well as milk; and soon after calving she has given fifteen pounds per week. When the Yorkshire cow is purchased for the London dairies, it is generally after she has had her third calf, when the milk changes its character, and becomes less infused with butyraceous qualities. This arises from her no longer having the run of her rich native pastures to graze upon. The object of the London dairyman, and those of other large towns, is not to improve the quality, but to increase the quantity, of the milk; and hence the animals are fed with brewers' grains, boiled linseed, &c., &c.; and the out-door exercise is restricted, so that their powers of secretion all converge to the production of milk alone. Considering all these things, and taking into account the carcass value of the cow after she has yielded her copious supplies of milk, it is not too much to affirm that there is no breed of the vaccine race so profitable as the Yorkshire cow.

THE ALDERNEY BREED.

Among the short-horned race must be enumerated that singular breed of cattle called Alderneys, which has gained, and deserves, a degree of celebrity from the peculiar richness of the milk afforded by the cows. These cattle were originally from Normandy and the islands on the French coast, from one of which (Alderney) they take their name. They are small in size, awkwardly shaped, with a peculiar bend in the back, and, in every point, more or less defective. The milk yielded is not great in quantity, but abounds with butter; and it is from its richness that these animals are favourites. Improbable as it might seem, from the appearance of the Alderney, its aptitude to fatten is remarkable. Even the cows, when dried, soon gain flesh, and will attain to considerable weight. It is chiefly in pleasure-grounds, and the paddocks attached to the houses of persons not engaged in farming for profit, that cows of this breed are to be seen. In Hampshire alone the Alderney breed is general, constituting the stock of the farmer. It would appear that it is more suited to the pasturage of that county than other vaccine animals which require richer grazing grounds, consume a large quantity of food, and return a disproportionate supply of milk.

The qualities of the Alderney breed being exclusively milk-producing, it cannot be expected that they will be remarkable for any great beauty of form. Indeed, until within the last thirty years, a more ill-formed animal could hardly be conceived. Its characters were large cheeks, thin, hollow neck, flat sides, hollow back, thin hams, long between hip and ribs, drooping rump, high shoulders, crooked legs, and tapering chest. Such were its characters; but, as amongst mankind, there is many a good head under an old hat, and many a white skin under a poor garb; so in the

ungainly form of the Alderney, there lurked qualities of excellence of the highest degree.

"The produce of these small animals, both in milk and butter," says Mr. Milburn, "is very great, and may be taken, in fair specimens, at twenty quarts of milk daily, and ten pounds of butter in the week, during the months of April, May, June, July, and August. Instances are recorded of cows giving twenty-six quarts of milk in the twenty-four hours, and yielding as much as fourteen pounds of butter per week! From this it is clear that the cream is of a very rich quality; the milk itself being superior to much of the town-made cream, and the cream almost resembling cream-cheese. It is considered too rich by many persons for making cheese; but instances are recorded of successful cheese-making from this milk. M. Le Feuvre, of La Hogue, succeeded in making cheese of a very superior quality from this fine milk; equal, indeed, to double Gloucester. Fourteen quarts of milk being capable of producing a pound of butter, the same quantity would give a pound and a-half of cheese; and the whey, or drainings, of twenty pounds of this cheese, would produce four pounds of butter, somewhat inferior for toast, but quite adequate for the making of pastry. Compared with the milk of any other cows celebrated for dairy purposes, that of the Alderney is very superior. An experiment was made, in the months of May, June, July, and August, between eight Alderney and eight Kerry cows. In the first month, the Alderneys gave 25 per cent. of cream, against 10 per cent. of Kerrys; in June, 20 per cent. against 10; in July, 23 per cent. against 10; and in August, 16 per cent. against 13; giving an average of about 100 per cent. more cream than the Kerrys—a race of cows rather celebrated for dairy qualities. But this was not all. Three pints of cream from the Alderneys produced 1 lb. 8½ oz. of butter; from the Kerrys, 1 lb. 4½ oz. This, too, was taken in the month of August, when it will be seen the milk of the Alderneys was falling off. The experiment was made by Mr. White, on the farm of the Hon. R. Clive, of Oakley Park, and deserves every credit, as it seems to have been carefully made." These facts sufficiently establish the great value of the Alderneys.

SCOTTISH KYLOE BREED.

With respect to other breeds of which we have as yet said nothing, we may observe, that in the Highlands of Scotland, a race of small black cattle prevails, of which large herds are driven southwards, and depastured in the grazing-lands of England. Of these, numbers are brought to the London market. Many varieties of the race exist. Among them we may particularise the Kyloes of the Western Islands and the Hebrides—small, but hardy and well-formed cattle, thriving on coarse fare, and producing fine-grained and high-flavoured meat. The different islands of the Hebrides contain, says Mr. Youatt, "about one hundred and fifty thousand of these cattle, of which it is calculated that one-fifth are annually sent to the mainland, principally through Jura, or across the ferry of the Isle of Skye. If these average about £5 per head, the amount will be £150,000, or more than the rental of the whole island, which Mr. Macdonald calculated at £106,720, but which now produces a greater sum. Cattle, therefore, constitute the staple commodity of the Hebrides. Some thousands are annually exported from the island of Islay alone."

The cattle of this breed are so called from the fact of their having crossed the *Kyles*, or ferries, with which the Highlands of Scotland abound. They formed the models which Bakewell had in view when endeavouring to improve the Leicestershire breed; and had he been better acquainted with them in the early stages, they might have taken their part in the crossings which were made with the view of improving the Disbley herd. They may be esteemed the finest breed of the largest middle-horned race, being possessed of long *rumps*, *loins*, and *crops*, with but a moderate amount of offal. As length in these parts is generally connected or associated with thinness of chest, buttocks, and neck, it is not unlikely that improvements in this direction would enable the dairyman to obtain a rich milk-secreting animal, with considerable aptitude to fatten and form flesh on the most valuable parts, when she passed from his hands into those of the grazier.

The Kyloe cow is of a wild disposition, which is, in a great degree, counterbalanced by

her hardihood, as she can resist an atmosphere beneath the storms of which a delicate lowland animal would succumb. Her living, too, is extremely hard. It consists of the patches of short grass which she gathers among the heath, moss, and even sometimes sea-weed. In winter, when even this sort of provender is scarce, Kyloes are sometimes assisted with a few oatmeal balls, which, if they have any reflective instincts, they must consider as a sort of providential dispensation. From such kind of feeding much produce is not to be expected; consequently, the supplies of both butter and cheese are miserably small—thirty-two pounds of the former, *per annum*, is the produce of one Hebridean cow. Of the latter, from ninety to one hundred pounds is the average yield, and this is finely flavoured with aromatic herbs, peculiarly agreeable to the palates of many individuals.

ARGYLESHIRE CATTLE.

In the north of Argyleshire, the cattle are larger than those of the Hebrides, and are bred to the full size which the pasturage will admit, and the good qualities of the animal bear, without deterioration. It is in this district that the most perfect Highland cattle are to be frequently seen. The animals are compactly built, short, and rather strong in the shank; straight in the back; with a fine muzzle; and small sharp horns. As they wander over a wild country, they are themselves wild, and often fierce, and their eye expresses energy and spirit. It is solely for their flesh that herds of them are reared. "Every effort," says Mr. Youatt, "to qualify them for the dairy, will not only lessen their hardiness of constitution and propensity to fatten, but will fail in rendering them valuable for the purpose at which the farmer foolishly aims."

THE HIGHLAND SCOT.

The Highland Scot belongs to a long-horned breed, and stands next to the Hereford as a fattening animal; and where both the Hereford and the short-horned races would die from absolute starvation, it will clothe its loins with flesh, and look as comfortable as if it were the finest-fed quadruped in the land. Like all mountain races, the Highland Scot delights in freedom. To browse on the side or the summit of the hill is, to him, like "a joy for ever;" whilst his eminently gregarious habits force him into the bovine society of his neighbours; so that, if he has any cares, he lightens their weight by the pleasures of association. Although he is extremely hardy, his size is rather small than large; and his usual colour is a light dun, or a jet-black, rarely with white on any part of the body. His horns are long, and have an upward and outward turn. His skin is covered with a sort of fleece rather than hair, being long and soft, with a strong inclination to curl. He takes on his beef principally on the back, which is therefore straight, while his body has a considerable degree of rotundity. It is not the least of his peculiarities that he obtains, from the surface of the sterile mountain, as much grass as he can fatten upon; or, at all events, preserves himself in good living condition. If he is indulged and tended with some little care, he increases in fat very rapidly, and repays his breeder by the excellence of his beef. Under such circumstances, the Highland Scot will weigh from forty-eight to fifty stones, and some have even attained to the weight of seventy. There are special exceptions, however, to this rule. The Duke of Northumberland had a very promising Argyleshire "stot," or bullock, which he kept as long as he could, to see what he would weigh. He was five and a-half years old, and weighed, exclusive of offal, 100 stones 4 lbs. Though, perhaps, one of the heaviest of the breed ever slaughtered, he was neither the fattest nor the most inactive, but seemed in that state to display all the activity possessed by his race whilst wandering over their native hills.

The rearing of this animal was by no means remarkable for its extravagance. In the first winter he was turned out to a poor pasture, and had a little bad hay, till summer returned, when he had again poor land pasture. The next winter he was turned again to the same kind of pasture, which was, however, varied with a few turnips. During the following summer he had average pasture, and the same pasture in winter, with a more liberal allowance of turnips. The third summer he was tolerably well grazed; and in the fourth winter he had as many turnips as he could eat in the sheltered straw fold. In the summer in which he was fatted, he had all the indulgence of a feeding

animal—viz., cut clover, mangel-wurzel, hay, bean-meal, turnips, and a little oil-cake, for which he had no relish whatever. Mr. Quarl says of this animal, that his "fat was distributed in an uncommonly equable manner, of a colour resembling the finest grass butter, and as firm as wax; the lyer (muscle) was in ample proportion, bright in colour, of fine texture, and beautifully marbled by admixture of his excellent fat."

THE ABERDEENSHIRE BREED.

The Aberdeenshire "Doddies," as this breed are called, are a polled, or hornless race; and being bad, or, at least, very indifferent milkers, they are usually passed over to the grazier, and highly fattened in their native county. They are also purchased by the Norfolk and Leicestershire grazier for the purpose of high feeding, and attain the weight of eighty, and even one hundred stones, when five or six years old. Like all the hardy Scotch cattle, they form their flesh on the back. Their colour is generally black, but sometimes red the head is fine; the eye full and clear; the breast deep; and the back not quite straight, being somewhat depressed at the loin, and inclining to be narrow.

THE GALLOWAY BREED.

In the stewartry of Kirkcudbright, together with part of Ayrshire and Dumfries, forming the old province of Galloway, a beautiful polled or hornless breed of cattle exists, highly esteemed for many excellences. In figure they are admirable, excepting that the neck of the bull is almost too thick; but the chest is deep, the limbs clean and short, the back straight, and the body round. Black is the prevailing colour. These cattle exceed the Argyle breed in size. They fatten well and quickly, and their flesh is excellent. "Few cattle sell so high in the London market; and it is no uncommon thing to see one of these little bullocks outsell a coarse Lincolnshire bullock, although the latter is heavier by several stones." The Galloway cattle are remarkable for gentleness; and robust and muscular as the bulls are, one of mischievous habits and bad temper is seldom met with. In the *Cyclopædia of Agriculture*, edited by Mr. Morton, we find it stated that the Galloway is sometimes called a Kyloe without horns, from the great resemblance which these animals bear to each other. The Galloways, however, have already had to yield to the short-horns in those parts of their native district where the turnip husbandry can be prosecuted to advantage; while the Ayrshires have justly supplanted them for the dairy; but, in those parts where the rearing of grazing-cattle is found the more suitable practice, they still reign unrivalled, and should be carefully preserved as a distinct breed.

THE AYRSHIRE BREED.

This valuable breed of middle-horned cattle exceeds, perhaps, any breed of dairy-fed cows in the kingdom; but they are small in size, and unsymmetrical in their forms. Their milk is extremely rich, though somewhat oily in its nature. They fatten more rapidly than many other races of cattle; for, when the butyraceous deposit is stopped by drying, the system soon accustoms itself to secrete fat, which they acquire on a pasture inferior to that required by more tender animals. They are, however, in small estimation with the grazier, although, when the cow is coupled with a short-horn bull, a valuable grazing animal is produced. Many farmers in the west of Scotland practise this successfully on a large scale.

There is no description of the race equal to that given by Mr. Aiton, whose work on *Dairy Husbandry* so far exceeds any other, that it is generally quoted, even at the present day:—"Head small, but rather long and narrow at the muzzle; the eye small, but smart and lively; the horns small, clear, crooked, and, at their roots, placed at a considerable distance from each other; neck long and slender, tapering towards the head, with no loose skin below; shoulders thin; fore quarters light; hind quarters large; back straight, broad behind; the joints rather loose and open; carcass deep, and pelvis capacious, and wide over the hips, with round fleshy buttocks; tail long and small; legs small and short, with firm joints; udder capacious, broad, and square, stretching forward, and neither fleshy, low hung, nor loose; the milk-veins large and prominent; teats short, all pointing outwards, and at a considerable distance from each other; skin thin and soft; hair soft and woolly. The

head, bones, horns, and all parts of least value, small; and the general figure compact and well proportioned." Such is Mr. Aiton's description; but, with the exception of thickness of buttock, it will be inappropriate to the present Ayrshire cow. There are two other characteristics which seem so thoroughly belonging to this breed, that they ought not to be passed over. The one is the black muzzle, and the other the yellow red, which seems to be the natural colour of the race—arranged, not in considerable quantities, but in blots or patches. Thus the animals generally present a sort of checked aspect of golden yellow, red, and white.

The milk and butter yielded by the Ayrshire cow are very considerable. Indeed, to develop her milking qualities the greatest pains have been taken in her native county. An Ayrshire cow will give from 600 to 800 gallons of milk in the course of the year; and five gallons per day is by no means uncommon for three months after calving. This, however, falls short of Colonel Fullarton's estimate, in his *Agriculture of Ayrshire*, where, it is affirmed that, though the Ayrshire cow will not, when fat, weigh more than twenty to forty English stones, "it is not uncommon for these small cows to give from twenty-four to thirty-four English quarts of milk daily during the summer months, while some of them will give as much as forty quarts." It is found that three gallons and a-half of such milk will yield a pound and a-half of butter; so that as much as 260 pounds of butter will be produced by an Ayrshire cow; and it is no uncommon thing to have eight or nine pounds given by one of these cows for some weeks after calving. About twenty-six gallons of milk will afford fourteen pounds of cheese; or a good cow will yield thirty-five stones of cheese per annum.

A question has been raised, as to whether the rich districts of Ayrshire ought to be occupied by this breed of cattle, as they are supposed to be better adapted to the means of the cotter than those of the grazier. To this it has been replied, "that while the cold rains, so prevalent in that county, would render it problematical whether the short-horns would be sufficiently hardy, it is also certain that the second-rate pasturage of much of the grass land is more suitable for the dairy cow, possessing the hardiness of the Ayrshire breed, than calculated for fattening the less enduring short-horn." Whatever attempted improvements which have been made in the Ayrshire breed, they have not succeeded in enhancing their milking qualities. To breed what would sell in England, and what would feed as steers, has been an object pretty generally pursued; and, as the larger breed of Ayrshire cattle are more profitable for the market than the smaller, which are more suitable for the dairy, the former have been more encouraged.

The difficulties which present themselves, in endeavouring to settle the origin of the different species of our domestic animals, are very great. It is hardly possible to believe that the long-horned Craven cow and the polled Angus, the gentle, quiet short-horn, and the wild and ferocious breed of Chillingham, can be of the same origin. The question is, however, one of great latitude, and takes by far too wide a range to be here discussed; but there does not seem any reasonable doubt for the fact, that, within certain limits, circumstances alone will have a great tendency to change the conformations and characteristics of a species. Thus, in cold countries, white predominates over other colours; and wool or fur is the species of covering with which nature clothes the animals. In hotter climates, brown is most prevalent, and hair takes the place of the wool and the fur. In tropical countries, the dun hue obtains, and down spreads itself over the bodies of the brute creation. "So easy is the adaptation of organised beings to the state in which they are placed," observes a writer on this subject, "and so vast is the expansibility of nature, that she can extend, or shorten, or increase, or diminish conformation, so as to render it suitable to the wants, the happiness, and the existence of the animal. Thus, though the *bones* of the bison and the Galloway may present but small distinction, yet the difference of skin, of mane, and of muscle, would make an ordinary observer startle at the idea of their having a common origin. The skull of a wolf and that of a wild dog of New Holland, are all but identical; and it is possible that the influence of pasture may lengthen or shorten the horns—that by breeding from long or short-horned, or from horuless animals,

the variety may be perpetuated, till they lose, in the course of ages, many of their original characteristics. It is impossible, for instance, in Essex, to grow the ox to the same size, other things being equal, as in the county of Durham; nor on the Ayrshire hills can he be produced in the same form or stature as in the Devonshire valleys. The Highland Scot is suited to the cold climate of the exposed and stormy north, and the short-horn to the sunny lowland pastures; and who shall say that the God of nature has not impressed on these created beings the capability of adapting themselves to his plastic handiwork, of developing their tendency to follow the peculiarities of the situation in which they are placed? An elephant can never degenerate into a mouse—a cat never improve into a tiger—but a wild dun cow of Warwick may be the progenitor alike of the thin, spare, feeble-looking Alderney, and the flesh-mountain ox of Durham."

On the same subject, Dr. Prichard remarks:—"In all our stocks of domesticated animals, we see profuse and infinite variety; and, in the races of wild animals, from which they originally descended, we find a uniform colour and figure, for the most part, to prevail. Domestication is to animals what cultivation is to vegetables; and the former probably differs from the natural state of the one class of beings, in the same circumstances which distinguish the latter from the natural condition of the other class. The most apparent of these is the abundant supply of the peculiar stimuli of each kind. Animals in a wild state procure a simple and unvaried food in precarious and deficient quantities, and are exposed to the inclemencies of the seasons. Their young are produced in similar circumstances to the state of seedlings, which spring uncultivated in a poor soil; but, in the improved state, all the stimuli of varied food, of warmth, &c., are afforded in abundance; and the consequence is, a luxuriant growth and *evolution of varieties*, and the exhibition of all the perfections to which each species is capable of being brought in a domesticated state."

We will close this chapter with a few brief remarks on some of the original breeds of France.

FRENCH BREEDS.

Normandy.—The colour of these animals is various. They are rather coarse in bone, but nevertheless are good-looking beasts, and have the reputation of giving an abundance of milk of excellent quality. They early arrive at maturity, and are, on the whole, the most useful and improvable animal of pure breed which the French possess. They are not unlike our Buckinghamshire breed in appearance, but smaller and finer. The *Flemish.*—In colour a rich brown, mostly with white faces, very good and clean-looking; but flat-sided, and stand rather too high on the leg. The *Charolaise.*—This is one of the breeds most prized in France for meat. They are very neat white beasts, kind and cheerful-looking, and good handlers. They are not unlike the Devons in everything but colour. The *Gascony* is an animal of good size, but coarse, and of either a black or grey colour. The *Garonnaise* or *Aguenaise.*—Good in size, and in excellent condition; but heavy and coarse about the head, hollow in the back, and with very drooping hind quarters. The colour is a light fawn. The *Bazaidaise* are very good-looking, but also fail in the hind quarters. Mouse-coloured. The *Limousine.*—Not unlike the Garonnaise breed both in colour and appearance, but smaller. The *Salers, d'Aubrac, Auvergne,* and *Mezenc,* are not worth much notice: the Salers are the best. Nor are the *Partheraise,* another fawn-coloured beast, much better. The *Brittany* is small, but very neat, hardy, and useful. The colour is black and white.—Such are considered some of the most prominent of the pure French breeds.

CHAPTER III.

AGRICULTURAL ASSOCIATIONS; THE PRINCIPLES OF CATTLE-BREEDING; FAT-ACCUMULATING BREEDS; MILK-YIELDING BREEDS.

AGRICULTURAL ASSOCIATIONS.

One of the best modes of advancing the interests of the farmer, is by that kind of agricultural association which has sprung up amongst us, and which has already been the means of effecting great improvements in those countries where it has been spiritedly adopted. In England, almost every county has now its agricultural society, consisting mostly of practical men, who meet for the purpose of discussing those points that are more immediately interesting to themselves; and, indeed, no branch of occupation requires so much of this combination, or is literally more dependent on it for its advancement. Taking into consideration the ordinary operations by which farming is conducted—its rotations and shifts—how few are the opportunities which present themselves for any one, in the course of his life, to avail himself even of his own experience. Experiments generally are costly, and the results often too uncertain to be pursued by one who has to live by the produce of his acres. Hence it becomes of vital importance that he should derive knowledge for his own working, as it may be presented to him, through the experience of others. In this country, seed-time and harvest occur but once in the annual revolution of the earth in its orbit; and, should the husbandman fail in an experiment (unlike the manufacturer, who can immediately and incessantly repeat his trials until success rewards his exertions), he cannot retrace his steps, or begin again, as the revolving year requires a different crop. The exigencies of a general system of rotation demand another course. The soil will not yield its increase without alternation; and he is, therefore, compelled to wait an appointed time before he can take advantage of the experience which has enabled him to ascertain the cause of his previous failure. Science, it is true, has largely revealed the vast resources of the soil, and has modified the general laws of cropping; but the theory of to-day must be established by the practice of another day; and the success or failure requires the wholesome filtration of discussion, before any fact can be satisfactorily established.

We owe it to the enlightened agriculturists of Scotland, that such associations now exist. During the last century, a small body of Scotch landowners formed themselves into a "Society of Improvers in the Knowledge of Agriculture;" and to this humble beginning may be traced all the associations that have since sprung up, not only in Great Britain, but throughout the countries of Europe, and on the continent of America, until, at length, the importance of the subject has compelled a recognition on the part of various governments. In France and Belgium there are separate ministerial departments, under whose care and surveillance progress is made in all that belongs to agriculture; and the international exhibition which took place at Paris, has been productive of very important results, in radiating, throughout the empires and kingdoms of the European continent, the experience that was collected at that Agricultural Congress. Our own exhibitions have also done much; and if we cast a glance across the Atlantic, we find that in Canada there are provincial associations, both in the Upper and the Lower province. At Toronto, in Upper Canada, a central agricultural and horticultural society was organised some years ago. There are also a *bureau* and boards of agriculture; and a provision was made for imparting "a knowledge of the science and art of agriculture" in the various schools, and even in the colleges and universities. These have already been, no doubt, instrumental in placing this great colony foremost among the ranks of agricultural countries. Both in Nova Scotia and New Brunswick there are associations; and, in one of the reports of the latter, we find it stated, that "our farmers are now convinced, by experience, that they (the West Highland cattle) are the best adapted to our climate

and pasture, crossing advantageously with our best milchers, producing profitable dairy cows, and superior working oxen, that are unequalled *for wading through deep snow.*" In the United States such associations are also numerous.

The annual Smithfield Show in the metropolis is interesting, not only to those immediately engaged in agricultural pursuits, but to every one who reflects upon the importance of the ox in a commercial sense, independently of every other consideration. Here are to be seen the results of exertions, principally carried on during the last ninety years, to unite and bring to perfection the most desirable points in the various breeds of domestic animals which were once peculiar to different parts of Great Britain, but are now spread, in their improved form, over every part of the country. In connection with them are to be seen agricultural implements and machinery of the latest and most improved construction; roots and plants adapted to our climate, but which are as yet comparatively unknown; specimens of artificial manures, and of the soils of districts differing from each other in their geological formation. In spite of all the advances which agriculture has made during the present century, how slowly do improvements extend beyond the intelligent circle in which they are first adopted: but it is one of the great advantages of cattle exhibitions to spread them more rapidly and widely, by drawing the agriculturist from the secluded scenes in which he carries on his occupations, and bringing them before him in the manner best calculated to demonstrate their utility. A prize ox or sheep is fatter than the ordinary market requires; and hence it is often supposed that the stimulus of prizes for bringing an animal into a state of unnecessary fatness is altogether a work of supererogation. But the power of reaching an excessive size is simply a test. A piece of artillery is tried by a charge greater than is ever required in ordinary practice; and an ox is fattened for exhibition beyond a useful marketable condition, simply to show the capacity of the breed for acquiring, at the least expense of food, and at the earliest age, such a condition as the public demand really renders necessary.

If we look at the farmer of a former period, located generally in some isolated spot—his very vocation keeping him, as it were, apart and separate from others—his only opportunity of meeting with his fellow-agriculturists being, probably, confined to the weekly market at the county town—the means of travelling being limited, and communication, even by letter, restricted by the expensiveness of transmission—there was nothing left for him but to continue in the practices handed down to him. The very situation made him cling to old recollections; and hence, no doubt, has, in part, arisen the character imputed to him, of a dislike to innovation, and an obstinate adherence to the routine of a bygone age, even possibly when his judgment had been awakened by the progress he saw around him. But what a change is now presented! His means of communication have been expanded; the power of steam has opened up a speedier as well as a cheaper mode of transit; the researches of the chemist have brought about a change in agricultural operations; and, to keep up with the spirit of the age, he is, in a manner, compelled to unite with his fellows, in order that he may learn, and not be left behind in the race. Farmers' clubs are, in the most obscure districts, springing up. The principle of association has been established; and it is the farmer's own fault if he does not take advantage of what our French neighbours call "the situation." Every subject connected with agriculture is brought under discussion. The tiller of the soil begins to find that he holds an important position in the country; and he now opens his eyes to the fact, that his occupation is a science, and that he must, of necessity, raise himself to the height of his calling.

THE PRINCIPLES OF CATTLE-BREEDING.

"One of the most wonderful instances of man's supremacy over creation," observes Mr. Milburn, "is the influence he is able to exercise in directing vital processes. Here his power is perfectly talismanic. Within certain limits, he has the power of asserting his dominion so far as to make stern nature obey, and do his bidding. If he wants size or hardihood, activity or gentleness, milk or fat—nay, even wool, or mutton, or beef—he can so arrange the elements with which Divine Providence hath blessed him, as to bend, and mould, and adapt them to his will, until he has produced the kind and class of animal he requires.

This power arises more from individual skill than from science. Whatever physiological principles are involved, they are best discovered by the facts known to the breeder, and teach him little in the management of his business. The perseverance and skill, the powers of observation and discrimination possessed by some breeders, have doubtless been the cause of their success, and led to England's becoming pre-eminent for food-producing animals; for in no other part of the known world can it be said that there is anything like such specimens to be found, either for producing flesh, milk, butter, or cheese. To watch physiological tendencies, and avail themselves of all discoveries, was the practice of breeders long anterior to scientific research. Emulating the skill of the wily progenitor of the Jewish race, and intelligently perceiving what was required, Colling and Bakewell attempted, and attained, the art of producing cattle and sheep 'ring-straked, spotted, and speckled,' at pleasure. Seeing, also, the necessity of economising food, they set about cultivating those animals which came to maturity early, and thus produced a much larger quantity of animal food from the same amount of vegetation. Knowing that fat was an element favoured in a northern clime, they endeavoured to obtain animals with a tendency to secrete it in large quantities. In order to do this, they observed the qualities indicative of these tendencies; and, knowing that it is true in physiology, as in mathematics, that like produces like, they selected and bred from animals possessing them, until they stamped their qualities permanently and invariably on their produce. With these they managed to combine their usual concomitants, symmetry and beauty. Hence the origin of our flocks of Leicester sheep, and our herds of short-horn cattle, so intimately interwoven, even in their mortality, with the proud national boast of the 'Roast Beef of Old England.'"

In all animals there are certain distinctions or differences, which, in some individuals, are so strikingly marked as to lift them far above their congeners in particular excellences. Supposing, therefore, that two of these, a male and female, were chosen for breeding purposes; it is very likely that the breeder would expect their offspring to inherit the greater number, if not all, of those remarkable qualities for which their progenitors were distinguished. This, however, would probably not be the case, and the breeder would suffer great disappointment. It is from a knowledge of this fact, that many a breeder has resigned the hope of obtaining a good breed, and has ceased to persevere in his object. But he ought to remember that the principles of breeding are now pretty well ascertained, and require only patience and perseverance to carry them out to a success. Although the animals he had selected might have apparently been perfect in themselves, yet one of them, the cow, no doubt was an *accidental* product of excellence, and not the offspring of a reputable ancestry. Her progeny, therefore, exhibited the characters of her parents rather than those of herself. This is the reason why she did not produce her own form and likeness; but the breeder should have continued to select the best that he was able to procure; he should have persevered in his path, and, sooner or later, he would have had his pains rewarded by obtaining a breed which would have fulfilled the expectations with which he set out on his breeding experiments. It ought always to be borne in mind, that the obtainment of a breed of stock is not the labour of a month or a year, but of a lifetime. If it be the object of a breeder to produce a herd of cattle or a flock of sheep with some peculiar tendency, he, himself, may never so far accomplish it as to reap any real advantage from it, but his sons may, provided he has pursued his plans judiciously. Even in two or three generations, there is no certainty that the tendency which he wished to impart would be established. "There are not only limits, therefore, to the mathematical axiom that like produces like, modified by vital powers with which the breeder has to deal, but we think there is a principle deeper still—one little noticed by writers on breeding stock, yet one which all our great breeders knew and practised—viz., that some one animal has much more power of transmitting his qualities than others." The remarkable results of the Collings in cattle-breeding, were really due either to the skill they had in seeking their transmissive power, or to the accident of obtaining, by chance, an animal (their bull Hubback) who possessed it in a remarkable degree. Thus, in breeding

animals which have a great resemblance to each other, though the first generation may not satisfy the expectations of the experimentalist, yet a tendency will be given to the breed to progress in the proper direction; and by pursuing a careful system of selection, leading to the desired tendency, favourable results may be expected within the compass of a few generations.

The existing breeds of Great Britain present us with sufficient variety to enable us to produce any qualities required; whilst there are, comparatively speaking, very few obstacles in the way of making a selection. Skill, however, is necessary to preserve one variety of animals at the *top of the tree*, especially when the many excellent sorts to breed from are now so numerous. The original improvers had, perhaps, less difficulty than those of a more recent day in maintaining their position. It is true they had to work without rules or experience; but, like Adam and Eve, when they were driven from Paradise, they had the world before them, and they had fewer competitors. The race they improved was such, that every step they took was palpable and definite. There were fewer combinations of blood necessary, and, consequently, less risk of failure. The chief effort now, however, is directed to overcome a defect; and this is to be done by selecting a bull that is perfect in that part that is imperfect in the cow. On the first offspring of these there may be little or no visible improvement made; but if the same plan be continued, an impression will, by-and-by, be made, and the herd gradually assume a higher state of perfection. There will, however, still be variations. All the herd will not be alike; nor can this be expected; for even the fancy, or imagination—if we may be allowed the expression—of cows has an effect upon the colour and conformation of the calves they produce. One trial after another, however, must be made; and, although the process may be long, still, by paying great attention to the animals selected to breed from—by *weeding* them, as it is called—ultimate success may be expected as a certain result. Here, however, a question, which has frequently been agitated, forces itself upon the mind; and which is—"How far is this object to be accomplished by adopting a male, or making a change in the female animals?" Mr. Milburn says, the "universal consent of all classes of breeders is given to the value of the male: in selecting a stallion, the greatest care is taken; whilst there is little or no attention paid to the qualities of the mare that is sent to him. The flock-master will give from twenty to fifty pounds for the use of a ram, who would grudge to give five for a ewe: but it is, it must be confessed, somewhat different in cattle. The dairyman is very careful in selecting his cows. They are watched, as heifers, for the development of their good qualities, and are preserved, either for their succession to a maternal race of milkers, or because they are promising in themselves: but the bull to which they are sent is too often a matter of convenience rather than selection. They know he is a bull; and that is enough. The too-usual mode is, to try the heifer by her first calf. If she promises well as a milker, she is kept for a cow; if not, she is consigned as a 'drape' to the grazier, for the butcher. Reasoning from analogy, the mother would be naturally considered as more influencing the animal than the sire. The influence of the mother is long and continuous. Her blood flows through its veins; it partakes of her habits and sympathies; but still the vital force of the male animal is pre-eminent. Much as the mother may influence the constitution, the sire possesses a far greater sway over the conformation, the qualities, and the appearance. If, therefore, the object of the breeder is to perpetuate and impress the good qualities, and to remove the defects of his breed, he will be careful in the selection of both the sire and the dam of his breeding animals. A single failure—a single year's neglect—may stamp qualities on his race which it may take years to eradicate; for even to keep a breeding-stock in a high state of excellence, is by no means so easy a task as may be imagined." In connection with this part of our subject, the question of breeding *in-and-in* has also been much agitated, some taking one side, and some taking another. The celebrated Bakewell bred entirely from his own stock; but it is affirmed, by those who opposed his system, that his stock became comparatively diminutive and feeble, and that his plan was a failure. He, however, only put in practice one of the first axioms of breeding—namely,

to select *the best you can find*. He was acquainted with no stock so excellent, in his estimation, as his own. Consequently, he bred from them because they were unequalled anywhere else. He brought his animals to great perfection; imparted delicacy, uniformity, and permanency to his flock and to his herd; reared finer animals; and, if they were not so large as some others, they were less coarse, and produced much more palatable meat. All this he did; but, like many other experimentalists, he may have pursued his system to a point of refinement too far for the pains to be rewarded by an adequate degree of profit.

Breeding *in-and-in*, in the human subject, is said to produce various physical and mental disorders, and in every way to have a deteriorating effect upon the *genus homo*. To an exemplification of this, we ourselves have been a witness. At the foot of a mountain, near to the banks of the Gaerlock, running in from the river Clyde, in Scotland, there lived, in a few scattered huts, about from one hundred and fifty to two hundred Highlanders, who had bred *in-and-in*, it was supposed, for nearly a couple of centuries, and many of them were silly, and some of them quite idiotic. They had been ordered again and again off the estate, which had fallen into the hands of a new proprietor, but would take no notice; and had, at last, we believe, to be burned out. They then took their departure to a solitary glen among the mountains, where they pitched their camp, raised their *bothies*, and settled down to continue to perpetuate the idiotcy which their habit of inter-breeding had introduced amongst them. If a family afflicted with mania, scrofula, or consumption, intermarries with another family similarly afflicted, it is to be expected that the virulence of either of these will be increased, and that an early extinction of the race may be anticipated, provided the offspring do not ally themselves with a better, or a stronger and more healthy *breed*. The reason of this is, that the parents took the very plan to perpetuate, or render permanent, the evils with which they themselves were afflicted. Mr. Bates' maxim was, "Breed *in-and-in* from a bad stock, and you commit ruin and devastation."

In considering this part of our subject, the arguments of Mr. Milburn go to favour the system of breeding *in-and-in*. "The objectors to consanguineous breeding," he says, "and its deteriorating and enfeebling character, seem to forget that, in the case of the wild cattle at Chillingham Park [to which we have already alluded], no cross has been made for an immemorial number of centuries; and thus, unchanged and unchangeable, they remain, without deterioration, without feebleness—a standing objection to the indiscriminate condemnation of the system of breeding from the same stock. The answer, that these animals do not show any improved points, is an argument in favour of this system of breeding. The fact that they never had them, and possibly never will have the chance, so long as the breed is kept pure and unalloyed, is quite decisive in its favour. Like all other wild animals, a natural law prevents the feeble male from exercising any unfavourable tendency. The herd have a king, and, during the rutting season, fierce and almost deadly battles take place amongst the bulls for the favour of the females. The hardiest, strongest, and most enduring male is the victor, and he becomes the parent of the future herd. This may, and is likely to continue for some years; because, when once admitted a victor, a great change must take place before the contest will be renewed. No sooner, however, does the male animal become feeble, than another season renews the strife. The once proud patriarch is vanquished, and the youthful victor, full of vigour and virility, is, in turn, the paramour of the herd. Now, if we admit the influence of the male animal to be the greatest, we have here the most perfect adaptation for the weeding of the herd, and the best constitutioned bull is the parent of the whole race for two or three years of production. It is not wonderful, then, that they have no points, no superiority, no distinctiveness of breeding. There is no selection of adaptation, of symmetry—even of semblance; but there is strength of constitution in the male—the quality, above all others, best calculated for securing strength of constitution, hardness, and size in the offspring. Assuming that this tyrant strength in the patriarch of the herd will continue for three successive years—a feat extremely probable—there is a degree of consanguinity which few breeders will attempt. It may be said of Mr. Bates' herd, now that he is

dead, that their quality was unsurpassed, and that the heifers were frequently bulled by their own grandfather, or the cow by her grandson; and this was no more irregular than the wild habits of the whole herd at Chillingham, where the daughter, if not the grand-daughter, must breed with the grandsire or the sire." Mr. Colling, already alluded to, bred his animals in very close affinity. Mr. Mason, of Chilton, second only to Mr. Colling, was an *in-and-in* breeder; and every agriculturist is now aware of the success which crowned the persevering efforts of these gentlemen. The system of crossing is that which is quite opposite to consanguineous breeding; and when two animals entirely distinct, breed with each other, an independent variety is the result, and this is called either a mule or a hybrid. Where the zoological distinction between animals takes place beyond a given range, Nature steps in, and suffers no further admixture of the species. The mule is almost invariably non-producing; and although the union of a mule and female, of different qualities, will occasionally produce an excellent combination of the qualities of both, with, perhaps, a fair proportion of uniformity, still the union of these again amongst themselves will not be so happy. Indeed, they are likely to throw only mongrels, differing even widely from each other, and no more like their parents, than an ordinary piece of frail humanity might be considered to be to Hercules. For example, a cross was tried between the hard-working Devon and the fat-accumulating Hereford; but it was a failure. The strength and activity of the former were *nowhere;* whilst the fattening qualities of the latter were not obtained. A similar cross with the Albany was also a failure; as was another cross between the Hereford and the Kyloe. A cross between the short-horn bull and the Ayrshire cow, only takes the latter from the dairy, and gives her to the butcher.

The most successful cross ever made, was between the Galloway cattle and the improved short-horn, effected by Mr. Colling. He put one of his short-horn bulls to a well-selected Galloway cow; and the produce was a bull. He proceeded no further with this cross, but carried the blood to his short-horn herd. To this bull he put a short-horn heifer, with a large accession of Hubback blood. The produce of this union was another bull, the sire of his cow Lady, which, at his sale, sold for 206 guineas. From this cross, the probability is, that the straight back, the round form, and the wide hips were, in some degree, due to this Galloway cross, as well as that shortness of leg, which is the most striking defect of the Teeswater cattle, and which the Collings were so anxious to improve. This cross, notwithstanding its encroachments upon the purity of the blood, is certainly a most successful and most judicious instance; for where a large and strong-framed animal is covered with a short-horn bull, not only quality, but readiness to fatten is imparted. To proceed further is, perhaps, not wise. Attempting a system of crossing with milk-producing cows, is considered both unnatural and absurd; but there is no sort of large-framed animal intended for the grazier, which might not be improved by a cross, for one generation, with the short-horn. With the smaller West Highland cattle, even for grazing, reasonable doubts may be entertained. They live in a bleak and comparatively sterile district, to which a dash of short-horn blood, however small, could hardly ever accommodate itself; but, to the larger Scotch breeds, the same sentiment does not apply, as a single crossing would be invaluable. This is instanced in the case of a cross between a short-horn bull and a large Aberdeenshire cow, to which was awarded a prize by the Highland and Agricultural Society of Scotland. The live weight of this cow was 224 stone, of 14 lbs. to the stone; and she weighed when killed, 173 stone 3 lbs.

In considering this subject of crossing, some very singular facts have been discovered. These have been arranged and classified; they exhibit a kind of phenomenon so extraordinary, that they cannot fail forcibly to strike the mind of every person who has given the slightest attention to this matter. It would seem that, when a pure-bred animal has been once impregnated by one of another breed, the one impregnated is thereby, for ever afterwards, a cross, and may be expected, for the future, to produce cross-bred, and no more pure-bred young. But the idea is capable of still further extension; for a female animal will always produce young that will have a strong resemblance, in character, to the animal by

which she was first impregnated, whether of a cross breed, or of the same breed as herself. Should it, therefore, be the case that a single cross will stamp its character for ever upon the animal which is the subject of it, there is the greatest necessity for the utmost vigilance and caution to be used in selecting a male animal, especially in the first impregnation of the female. Dr. Harvey, of Aberdeen, and Professor M'Gillivray, hypothetically consider that the intimate connection in bovine animals, between the fœtus and its mother—consisting of an absolute circulation of the blood of the fœtus through the veins of the mother, and *vice versâ*—so impregnates her with the vital functions of the sire, as to render her, for ever afterwards, incapable of transmitting her own qualities unimpaired to her offspring. This, therefore, forces upon her breeding qualities the same characters as those which marked her first young, entirely independent of either the defects or the beauties of the sire. Several well-authenticated facts will effectually establish this view. One of the Earls of Morton had a chesnut mare, which was put to a quagger, or wild ass. The offspring gave the most unmistakable signs of the quagga in its head, its ears, its stripes on its shoulders, &c. Afterwards, in three successive seasons, the mare was put to a black Arabian horse, and in as many years the foal strictly resembled the quagga. In the *Transactions of the Royal Society*, it is stated that Sir Gore Ousely had a thoroughbred mare covered by a zebra. The produce was a striped animal, resembling its sire. The mare was afterwards covered by a thoroughbred horse; but a striped animal was the result: the year afterwards she was put to another horse, with the same result. Again, six black-faced, horned Scottish ewes were selected by Mr. H. Shaw, of Leochel, and were served, some with a Southdown, and others with a Leicester ram, the one white-faced, the other dun-faced, but both hornless. The lambs, as a matter of course, were crosses; and, in their second year, they were put to a horned ram of their own black-faced breed; but all the lambs were hornless, and their faces of a brownish colour. Again, they were put to a very superior ram of their own breed: on this occasion the crosses of some were less distinct; but two of the lambs were polled or hornless; one was dun-faced, with very small horns, and the other three were white-faced, with very small round horns only. The ewes were considered so impure as to be thrown out from the flock; and another lamb was never obtained from them by the breeder.

A favourite setter bitch, belonging to Dr. Hugh Smith, followed him one day in the season, and she was warded by an ugly cur, which was shot, and Dido, the setter, lost her nose in the partridge season. She was put to a superior setter; but her produce were the colour and picture of the cur; and, in her many subsequent litters, no other kind of animal could be obtained from her but a cur-looking puppy. Even among the porcine species there are singular instances of this kind. A person had a black-and-white sow, which became pregnant by a wild boar, of a dun colour. Of course the breed was mixed, or crossed, exhibiting symptoms of the qualities of both its parents. But the same sow was afterwards put to two different boars, and, in both instances, the dun colour pervaded the breed, though perfectly unusual before. The late Professor M'Gillivray tells us of an Aberdeenshire hornless heifer being put to a short-horn bull, and had her first cross calf to that animal. She was afterwards put to a pure-bred bull of her own kind; but she again had a cross calf, a horned animal, though both its parents were polled animals. The same authority mentions another instance of a different Aberdeenshire cow which had been served by a first cross between the Aberdeenshire and short-horn, and to this animal she had a cross-bred calf. In order to have a pure-bred calf from her, she was put to a pure Aberdeenshire bull; but the produce was a cross calf, both in colour and appearance. The evidence of such facts as these it is difficult to resist; but facts even stronger than these can be adduced to show the influence which the first impregnating animal has upon the female for ever afterwards.

In the case of Dr. Smith's Dido, it does not appear that her intercourse with the cur, if any, had been fruitful; but the following facts will show the impossibility of any connection whatever. Mr. Blaine had a pug bitch which made a companion of a small white spaniel. From this dog she was separated on account of her heat, and was warded by another of her

own breed. She threw puppies, one of which was slender and spaniel-like, and perfectly white; and, in two subsequent litters, she always produced one white puppy, though it might be less slender than the first. It is possible, however, that she might, at some period, have had unobserved intercourse with the spaniel; and if so, as a matter of course, the principle would be precisely similar to that which is involved in the preceding instances; but we have a case in which this was utterly impossible. A mare and a gelding had long been companions in the team, in the pasture, and in the stable. He was black, with white legs and face, and possessed of a singular rectangular form of hind legs. After an association of about two years, the mare was covered by a bay stallion, with black legs, which was the colour of her own. The foal exactly resembled the gelding, both in colour and shape, especially in the hind legs. Here connection was impossible.—We have already alluded to the effect of the imagination of the mother greatly influencing the colour and form of her offspring; and the following fact would seem to prove it. Mr. Boswell tells us of a hornless cow coming in season, when one of his neighbour's horned black-and-white oxen broke over the fence, and accompanied her home to the bull. Both the sire and the dam were black and hornless, nor had the farmer any horned or spotted beast on his farm. The produce of the cow was black and white; and, in due time, its horns grew, resembling those of the ox. These facts may not, in themselves, prove much; but they raise a doubt as to whether the imagination of the mother may not, in some indescribable way or other, operate upon the offspring.

Another point in connection with this subject is, the respective influence of the parents in determining the sex of the offspring. This part of our subject is necessarily involved in no small degree of mystery. Nature seems to have decided that the sexes should be pretty evenly balanced; but the causes which lead to this decision she has refused to develop to mankind. There is a great difference of opinion among physiologists as to whether the male or the female, the sire or the mother, has the greater influence in determining the sex. Sir Everard Home thought that the *ovum* or germ, previous to impregnation, is of no sex, but is so formed as to be equally fitted to become male or female; and that it is the process of impregnation which marks the sex, and forms either male or female generative organs; that, previous to the fourth month, the sex cannot be said to be confirmed, but that the parts, before that period, are so blended, that either the one or the other may be formed therefrom, as the tendency towards the paternal or maternal type may preponderate. This would account for the disposition which some animals have to beget a greater number of one sex or the other. Mr. Knight, a distinguished naturalist, inclined to the opinion that the female is principally concerned in the development of the sex. "In several species of domesticated animals," he says, "particular females are found to produce a majority of offspring of the same sex; and I have proved repeatedly, that by dividing a herd of thirty cows into three equal parts, I could calculate on a large majority of females from one part, males from another, and females from the remainder. I frequently endeavoured to change the habits by changing the male, but without success." In the *Philosophical Transactions*, mention is made of a gentleman who was the youngest of forty sons, all produced in succession, from three different wives, by one father, in Ireland. One instance is also recorded of seven successive daughters being born to a man by his first wife, and of seven sons by his second wife. As, in this matter, both statements and opinions contradict each other, the only conclusion to be drawn is, that both the male and the female possess a certain degree of influence in determining the sex—sometimes the one operating one way, and sometimes the other. Some degree of weight, however, is to be attached to the opinion, that where the male is older than the female, the majority of the offspring is likely to be males.

The rapidly-growing population of this country has long demanded a correspondingly extended supply of animal food, which has been furnished, not by the greater productiveness of the grazing districts, but by the growth of roots on arable farms; so that, in fact, a greater annual weight of meat is produced by the latter than the former. Whilst a larger

quantity of land has thus been devoted to the production of animal food, it has by no means diminished the supply of grain; but, on the contrary, has increased it by the enlarged quantity of manure which, in consequence, is supplied to the land—a fact so well established, that it has already become an adage, "No cattle, no dung; no dung, no corn." The objections that are sometimes raised against over-fed cattle, and the attempts made to disparage the "mountains of fat," as they are sometimes called, may be both sound and reasonable: there is no doubt of the practical fact, that the best butcher cannot sell anything but the best fatted beef. "Of whatever age, size, or shape a half-fatted ox may be, he is never selected by judges as fit for human food. Hence, a well-fatted animal always commands a better price per pound than one imperfectly fed; and the parts selected as the primest beef, are precisely those where there is the largest deposits of fat. The rump, the crop, and the sirloin (the very favourite cuts, which always command from twenty to twenty-five per cent. more than any other part of the ox), are precisely those parts on which the largest quantities of fat are found. Thus, instead of the taste and fashion of the age being against the excessive fattening of animals, it is, practically, exactly the reverse. Where there is the most fat there is the best lean; where there is the greatest amount of muscle, without its share of fat, that part is accounted inferior, and used for a different purpose. In fact, so far from fat being a disease, it is a condition of muscle necessary to its utility as food—a source of luxury to the rich, and of comfort to the poor." The fattening capabilities possessed by various animals, are the effect of a secretive power, which enables them to reserve a store of their superfluous food for seasons of cold or of scarcity. The fat masses itself round the angular bones of the animal, and gives it that comfortable appearance of rotundity upon which the eye feels pleased to rest. Hence the tendency to secrete fat is indicated by a *roundness* of form, as opposed to the *flatness* characteristic of the milk-yielding animal. The fat lubricates the joints, gives elasticity to the skin and muscles, and obviates the effects of pressure; but, above all, it is a store of heat-producing aliment, set aside for seasons of scarcity.

The larger portion of the diet of animals may be said to consist of a saccharine, an oleaginous, and an albuminous principle. To the first belong all the saccharine, starchy, and gummy parts of the plants, which, in the digestive organs, pass through changes similar to fermentation, before they can be assimilated; through them, also, is animal heat sustained. In sluggish animals, the oily portions of plants are deposited and converted into fat; and, when strength fails, it is taken up to supply the place of the consumed saccharine matter. The albuminous or gelatinous principle of plants is chiefly required to force the accumulation of muscle; while the ashes of plants, their unconsumable portions, are designed for the purpose of supplying bone, hair, and horn, as well as muscle and blood: they also replace the waste which is continually going on. Such are the several qualities which are essentially characteristic of a disposition to fatten. These marks are so definite and well understood, that they are comprehended and acted upon by every grazier. There is some difficulty, however, in endeavouring to describe, upon paper, all the indications of barrenness or fertility which a practised eye alone could detect. It is by experience and skill that the grazier acquires his knowledge, and not by theoretical rules. Observation, judgment, powerful perceptive faculties, and minute discrimination, are essential to his success.

One of his great reliances is on the *touch*, which may be esteemed the criterion of quality in every vaccine animal, whether to be bought for milking or grazing. The skin is a great indicator, and should neither be thick nor hard, nor should it adhere firmly to the muscles. If it does so, it may be concluded that the beast is a hard grazer, as well as a poor feeder; and as no man skilled in his calling will purchase her, she must be palmed off upon some novice, and even to him at such a price as can make her a sort of temptation to be got into his possession. On the other hand, the skin must neither hang loosely, nor exhibit that kind of flabbiness which is frequently seen upon indifferent cattle, and which discloses a delicate temperament, and a nature incapable of the retention of fat. Human physiologists give great attention to the subject of temperament; and though we do not make similar nice

distinctions in reference to brutes, yet is it of extreme importance to keep in mind those general and distinctive varieties of temperament which have a powerful operation upon the characters of various animals. Assigning, then, a broad division to the temperaments of animals, we might define them as consisting of three kinds—the nervous, the thoracic, and the abdominal. In proportion as the nervous system, the chest, or the abdomen, is strongly developed, an animal may be considered to belong to the one class or the other. In the breeding of oxen for the purposes of the butcher, the grand object has been to establish the supremacy of the belly, and to dethrone the empire of the cranium and the chest; or, in other words, to preserve and perpetuate that form of abdomen most favourable to the due performance of the digestive processes, affording the capability of extracting the utmost quantity of nourishment from the food, and, at the same time, diminishing as much as possible the development of the nervous system (which would induce too much irritability, and destroy that indolence and quietness so essential for the fattening process), as well as that of the organs of respiration, which give, at once, the capability and the disposition for muscular exertion.

In reference to the formation of the beast, in so far as it is susceptible of taking on fat, size must enter largely into the consideration where heavy weights are required. Christmas beef is not only expected to be large, but likewise to be fat. "The symbol of festivity," says Mr. Milburn, "should be capacious as well as prime;" and we agree with him. A spare scrag at Christmas would certainly be enough to "chill the genial current of the soul" of any Englishman who has heard of the bountiful fare upon which his ancestors of old regaled at this season of the year; but in reference to the grazier, who is buying in order to sell, profit alone must be his guide. It may be observed, however, that in accordance with the excellence of the grazing-ground, so will be the largeness of the animal fed upon it. Small animals certainly are much more easily fed; but then they are usually the result of a poor soil. Besides size, there must be *breadth* of carcass, which is indicative of fattening, perhaps, above all other qualifications. If rumps are favourite joints, and produce the best price, it is best to have the animal which will grow the longest, the broadest, and the best rump. The same may be said of crop, and of sirloin; but *breadth* is essential to the consumption of that quantity of food which is necessary to the development of a large amount of fat. Thus a deep wide chest, favourable for the respiratory and circulating functions, enables the animal to consume a large amount of food to burn up the sugary and deposit the fatty matter, as then useless, but afterwards to be prized. A full round crop will be of the same physiological utility; while a broad and open framework at the hips will afford scope for the action of the liver and kidneys. The head must be small and fine. Not, perhaps, that it is of any special use in the fattening of the animal to be so constructed, but it is indicative of the bones being small, and the legs short. For constitutional powers, the beast should have his ribs extended well towards the thigh-bones or hips, so as to leave as little unprotected space as possible. There must be no angular or abrupt points; all must be round, broad, and parallel. Any depression in the lean animal will show a deficient deposit of flesh and fat, when sold to the butcher, and thus deteriorate its value; and hence the animal must be round and full. But either fancy, or accident, or skill (we will not pretend to say which), has associated *symmetry* with quality and conformation, as a point of great importance in animals calculated for fattening; and there is no doubt that, to a certain extent, this is so. The beast must be a system of mathematical lines. To the advocate of symmetry, the setting-on of a tail will be a condemning fault. The ridge of the back like a straight line, with the outline of the belly exactly parallel, when viewed from the side, and a depth and squareness when viewed from behind, like a geometrical cube, may be said to be the indications of excellence in a fat ox. As a partial *résumé* of what we have said, we add, that the qualities desirable to be obtained for fattening, are pretty much the same in the greater number of domestic animals—that is, in those designed for animal food. They are—the capability of converting a given quantity of food into the utmost amount of flesh and fat, and the development of this meat on those parts of the body most esteemed for food. Thus

small heads, small legs, and small bones, altogether, are essential qualifications, and early maturity is equally desirable. Connected with these points are invariably found a peculiarly quiet and indolent disposition —what physiologists would term a lymphatic temperament — which is denoted by a fineness of the skin—a certain resistance to the touch, so to speak, caused by the development of those membranes immediately under the skin, which serve for the deposition of fat in common with other objects. In cows kept for the purposes of the dairy, where butter and cheese are the sources of profit, the considerations just mentioned, though not altogether to be lost sight of, are yet secondary to others—such as the development of the lactic system, &c.

MILK-YIELDING BREEDS.

The pasture of this country having great variety, means are thereby afforded for rearing cattle of every description; consequently, the fat-accumulating, as well as the milk-yielding breeds, have each that kind of pasture best adapted to accomplish the end which their owners have in view. The scheme of creation is so admirably adjusted to the wants of those living beings which inhabit it, that every race is apparently provided for. The granivorous and the carnivorous animal has each its destined food. The elephant, that roams the region of Central Africa, has its boundless forest, its thick and long grass, with innumerable herbaceous plants, provided to satisfy its appetite, and increase and sustain the enormous bulk to which it attains. The lion, in the same region, has countless herds of the eland and the gazelle to prey upon; whilst the birds of the air are equally cared for. Animals, however, reduced to a state of domestication, have not the same resources placed within their reach. They depend upon man for what they want; and as the exigencies of a highly cultivated civilisation press upon him the necessity of making provision for it, he becomes a rearer of cattle and a producer of milk, that he himself may be enabled to live by the profitable returns which such labours afford him. Flesh and milk being, to a large extent, essential to human existence, these are sought to be obtained in the greatest abundance, and in the highest state of perfection. For this reason, those animals that yield them to the largest extent are most eagerly desired; and, as nature has decreed that different races, and different individuals of these races, are better adapted than others to the secretion of the one or the other of these essential products, he selects such as he deems the most suitable for the object he has in view. There is no breed of which we are aware that is equally calculated to produce both to a profitable extent—the objects of the two secretions being quite different, and the tendencies and qualities essential for the production of both being sparingly conferred upon the same animal. As the production of milk is, more or less, characteristic of all kinds of animals, it must necessarily have its degrees of proportion, as well as quality, in accordance with the size, number, and nature of the progeny which is to be nurtured by it. Some will give large quantities, but thin and poor in quality; some smaller quantities, and rich in oily matter; while others will afford a small portion, but abundant in solid matter. For profitable or commercial purposes, the first will be selected by the milkman near the populous city; the second by the dairyman, whose product is intended to be butter; and the third by the maker of cheese.

The diffusion of the milk-yielding breeds is more extensive than any other, because they are capable of being advantageously maintained on that description of herbage which is not sufficiently nutritive to sustain the fat-secreting breeds. The bulk of the grass-lands on the clay soils of this country, on the sides of the uplands, and even on the poorer sands, is sufficient to supply the means of making butter or cheese; but it will not remunerate the attempt to feed cattle on herbage so inferior. The rich alluvial feeding-pastures, which generally skirt our rivers, are far more profitably employed in raising summer beef, than in the production of milk or butter.

How far is it possible to detect, by external conformation, the capabilities of the individual animal for the secretion of milk?—is a question well worthy the consideration of all those who are engaged in dairy husbandry. There are instances in every breed, where nature has more bountifully, or more sparingly, bestowed the qualities calculated to produce the secretion

for which the race may be celebrated; and there are, doubtless, well-known marks, which, to the dairyman, rarely fail to indicate the *status* of the animal in the range of qualities peculiar to his race. On the European continent, this knowledge has been professed to be carried to a very minute extent. François Guénon, a Frenchman, is said to have found a mode of deciding authoritatively, not only the quantity and quality of milk which would be yielded by any particular cow, but also the period for which she would retain her milk after calving. This he professed to determine by external appearances alone; and these of a somewhat arbitrary kind. The possession of such an invaluable species of knowledge to the farmer was not readily to be lost sight of. Accordingly, the Agricultural Society of Bordeaux appointed a committee, to test Guénon's capabilities; and they reported that, although the process by which he arrived at these conclusions was a secret, he had succeeded in satisfying them of the truth of his system. It was deemed, however, that it would be more satisfactory, if Guénon would submit it to a practical experimental test; and this was done in the following way:—Separate cows were brought from strange dairies, and he wrote down the characteristics and qualities of each. These were compared with the separate statements given by the owners of the animals; and, in cases of more than sixty head, he succeeded in stating all their peculiarities exactly, with the exception of a very slight difference in appraising the quantity of milk—a difference the committee attributed solely to the quality of food given to the animal.

At Cantal, the Central Society of Agriculture also reported upon his system with equal favour. Their description of the process of investigation pursued, is thus given:—"He accompanied the members of your committee to the farm of Veyrac, belonging to the president of the society. He examined, with scrupulous attention, the fine dairy cows of this domain, which is composed of one hundred milch cows of the best kind in the country. * * * * M. Guénon gave, upon each of them separately, precise indications as to the quantity of milk each of them give *per diem*, and the length of time they would hold their milk after being again in calf. We must avow to you, gentlemen, that they have, almost in every instance, agreed with the declarations of the owners of the cows." The mode he adopted has been made known in this country; and it has for its foundation the classification of all kinds of cattle into eight families. Each of these he divides into three sections, according to size only; and each section, again, he subdivides into eight orders. The distinguishing marks by which this division is made, are—1, the *Gravure*, which are those parts which commence at the udder, and extend at the bearing; 2, the *Epis*—a soft brush of hair on the udder of the animal; and, 3, *Contrepoil*, or hair growing the contrary way. These peculiarities form the distinction between the families and orders. Thus, if the gravure be large, the reservoir of milk will also be large, and the produce abundant. If it be formed of fine hair, and if the skin be of a yellowish hue, and a sort of bran-coloured powder fall from the skin, they are to be taken as the signs of a good milker. The *rationale* of the whole is, that the gravure is but a continuation of, and corresponds with, the lactiferous vessels under the belly of the animal. These "epis," he states, correspond with the reservoir of milk, and are tufts of hair growing the wrong way on the right or left of the bearing. The largest indicates the most rapid loss of milk. The contrepoil, or hair growing the wrong way on the gravure, amidst that which grows upwards, indicates a deficiency in the production of milk, even if the gravure be large.—Such is a general description of a system invested with minutiæ of no ordinary kind; and so precise and prolix, that it would even require numerous engravings to show the variations of family, class, and order. In speaking of this system, it has been remarked, that the observations of Guénon have been carried far beyond their legitimate objects, and are of a character rather indicative of quality; for while a wide capacity of upper udder, a fine hair, a yellow scurf, are somewhat too indefinite to classify very precisely, they are just the points which may indicate a fineness of quality, and a large lactiferous capacity, that may add to the physiological signs by which a milking-cow is judged by the practical grazier.

In a good dairy cow, a beautiful form is an unimportant point in the eye of the dairyman;

symmetry of proportion being no criterion of milking qualities. The *beau-ideal* of a fattened ox in section is a parallelogram, and a cylinder is that of his superficies; thus exhibiting the essence of *roundness*: whereas, the very converse is the perfection of the milker—that is, *flatness*. The following are the best-settled marks or characteristics of a milking cow:—Head small and fine; eye bright and full, but with a quiet and placid expression; neck deep and thin, which gives it an appearance of hollowness; shoulder and breast narrow, but projecting; ribs flat; rump broad, and tapering down to the knee joint, owing to the thighs being thin; tail small; udder large and round, with four teats, well-formed, tapering to the end, and at a moderate distance from each other; skin thin, and with plenty above; fore teats round and full, and with a large subcutaneous or milk-vein, as it is commonly, but erroneously called. There must, above all, be kindliness of touch, indicative at once of good breeding and of quiet disposition. These, united to a quiet and gentle temperament, are indications of milk-producing animals, which, when accompanied with health, are almost infallible criterions in the cow suitable for the dairyman.

CHAPTER IV.

FEEDING OF CATTLE.

In the pastoral districts of the United Kingdom, it might be imagined, that where fat is no longer regarded as a luxury at the tables of the rich, every mode which promotes its accumulation on cattle would be so generally known, that the most unsophisticated would be initiated into its mysteries. This, however, notwithstanding all that has been done, is not the case. "Everybody knows that rich alluvial pasturage, that linseed-cake and Swede turnips, that combinations of hay and bean-meal and ground corn, with a dozen kinds of roots, will feed cattle sooner or later. But the question now is simply one of *economy—How can the greatest number of pounds of beef be produced at the least possible cost?*" This is the point to be ascertained; and to do this, the grazier must make his selection of such beasts as will take on fat the most rapidly. By a physiological law, there are some which will sooner attain maturity than others, and so be earlier fit for feeding. As it requires no great amount of skill in a good grazier to select an animal that is likely to thrive under his management, he will make a choice of a drove, of five, or ten, or twenty animals; and nineteen of the last number will be the best grazers for his particular farm. In doing this, his eye, as well as the signs described in the chapter on the breeds of cattle, guide him; but, more than all, he is directed by the *touch*. After selecting the animals, the mode of feeding them is, to turn them out into a grass field, if possible, skirted by a river, where the alluvium of ages has been washed into the soil so deep, that the roots of the herbage cannot find its bottom, and so firmly comminuted as to admit of the smallest filaments of the radicles of the plants easily to penetrate it. It should likewise be so porous as to allow the air to enter, and the water to filter gently through it. All its elements should be kept in a state of solution, so delicate, that they may be always ready to nourish and strengthen the plants which consume them. It should, also, have all the elements of vegetation plentifully mixed up with it. On such a soil, a lean bullock will, in a few months, become fat, because he is nourished upon all the elements congenial to his nature. A little attention, to see that he is *well*, is all that is required from the time of his being placed in the pasture to his being taken to the butcher. There is neither labour

nor expense incurred. He is worth several pounds more when he is taken out of the pasture, than when he was put into it; and this is the grand point in the mind of the grazier. The requisites here laid down for feeding, are strictly conformable to experience. There is abundance of fresh and highly nutritive food; there is little or no labour in searching for and obtaining it; with water, and shelter, and warmth, and also plenty of air, and freedom from constraint. In feeding cattle in winter these should be the objects to be kept in view. They cannot feed in the open air; the cold and wet starve off the flesh as fast as the food lays it on; therefore, shelter must be provided for them.

In reference to the temperature at which the atmosphere should be kept for the feeding of animals, various opinions have been held. At the Leeds meeting of the Yorkshire Agricultural Society, this subject was partially discussed. The question was—Are we to run the risk of a wasteful expenditure of food by perspiration under excessive heat? or are we to induce them to burn it up, to keep up animal heat, by exposure to too much cold? Nay will not different classes of feeding animals be subject to different consequences, from the same degree of heat? In the same cow-house there may be some too hot, and others too cold, from their different constitutions. Oxen generally sweat at a temperature in which heifers thrive admirably. This happens, at any rate, till Christmas; after which they seem to be able to bear the same degree of heat as female animals. A gentleman tied up two sets of feeding bullocks—eight in a warmer shed than the rest, where they were allowed the same quantity and kind of food; but those in the warmer shed made more beef than those in the colder; thus showing that warm air, as well as warm food, is highly favourable to the fattening of short-horns. The temperature arrived at was about 55° to 60° of Fahrenheit. A temperature beyond this caused them to leave their food, and lose their tone and appetite.

Perfect quiet, and proper shelter, are very necessary to insure successful feeding. This fact is well known. An animal that has to search for its food will not readily fatten, because it gives off, in waste, the very principle that is necessary to enable it to accumulate fat. Hence the turnips for cattle should always be brought to them, instead of their being driven to the turnips. Whether animals feed fastest in the *dark*, or not, is another questioned point. "There can be no doubt whatever," says Mr. Milburn, "that anything which distracts their attention, which excites action, or which produces nervous irritation, is opposed to fattening; and as darkness will induce sleep, and promote quietness, it is so far favourable; but it is not so easy to have darkness and sufficiency of fresh air at the same time; and therefore, the best possible state, perhaps, is to have the feeding-houses rather in a state of shady gloom than in absolute darkness. A certain amount of nervous energy is necessary to give tone to the vital powers. Beyond this, repose and quietness are easily attained by a simple gloom; while shelter from flies and heat in summer, and from blasts, wet, and extreme cold in winter, should be carefully provided." The same gentleman adds, that abundance of good food, and regularity of feeding, are essentials in all kinds of fattening; and that it is not desirable to allow the animals to have food standing before them when they are filled; nor should they, on the other hand, ever experience a single feeling of want. The usual hours of feeding should be strictly adhered to, for the twofold purpose of inducing regular periods of sleep, and for supplying the system with food at the first call of appetite. Variety in the vegetables given them, too, is another most essential element of rapid fattening; and it may not be far from the truth to say, that all kinds of food are *equally* fattening, if they are given in sufficient variety. If roots, grain, and hay be changed every few days, the appetite is never cloyed; and the whole are devoured with a relish which develops fat in the most rapid manner.

In this country, food, to be esteemed palatable—indeed, to be consumable—must be fat. Unless it has this recommendation it is absolutely unsaleable. The tastes of the higher, and the necessities of the lower classes, demand well-fattened beef, mutton, and pork; and any meat brought to market in a lean or scraggy condition, is denounced as a sort of carrion. The younger members of the operative's family have to content themselves with

the vegetables and gravy; while the head of the family consumes the flesh, to enable him to perform his labour; and thus, when the fat is not available, one important source of the food of his household is dried up. For this reason the grazier must supply the whole of his animals in a fat state to the consumer. Be it observed, that it is not the number of animals, nor their weight in pounds and stones that he has to consider, but he has to provide for them the means of fattening before they can be brought to the consumer.

The preparation of food for the animal, or a system of cooking it, is a very important question; and, we believe, that all that a feeder can wish, is attained by the cooking of linseed. Steaming hay, potatoes, and turnips, was tried very carefully in Scotland, and failed. For *cattle*, at least, it was found useless, however valuable it might be for pigs. The fat of animals being analogous to vegetable oil, its elements are much of the same character as sugar, starch, and gum; and no doubt is entertained, by physiologists and chemists, that the fatty matter (vegetable oil) in plants, is assimilated into animal fat, with very little change. The elements of those compounds, severally, are:—

	Sugar.	Starch.	Gum.	Mucilage.	Animal fat (stearine).
Carbon . .	12	12	12	24	71
Hydrogen .	11	10	10	19	69
Oxygen . .	11	10	10	19	7

The oil contained in many seeds has been found to be, in—

	Oil per cent.
Linseed	11 to 22 say 17
Hempseed	14 „ 25 „ 19
Rapeseed	40 „ 70 „ 55
White mustard . . .	36 „ 38 „ 37
Sweet almond . . .	40 „ 54 „ 47
Bitter „ . . .	28 „ 46 „ 37

This analysis would lead to the conclusion, that any of these seeds are, so far as they are agreeable eating, useful; and when linseed contains as much as seven per cent. of mucilage, ten per cent. of sugar, and fifteen of soluble albumen, its great value for feeding and nutritive purposes is at once evident. There was some difficulty in grinding it by ordinary mills, as it clogged up the teeth; and when given to animals, either alone or combined with considerable quantities of corn, meal, or other feeding matter, the effect was purgative; and but few breeders persevere in the use of the seed alone. The demand for the oil, however, induced the crushing of the seeds to obtain it, and the refuse was converted into a valuable food for animals; while the portability of oil-cake, its cleanliness, and capability of being long kept, made it a general and desirable food, both for growing and feeding stock. The oil abstracted, the cake contains—

Water	10·05
Mucilage	39·10
Albumen and gluten . . .	22·14
Oil	11·93
Husks	9·53
Saline matter and sand . . .	7·25

Good English-made cake has now been thoroughly established as one of the very best fattening products; and the extensive farmers of Lincolnshire, and other places, expend upon a single farm, in one year, as much as from £100 to £500 for this article alone. It is the opinion of some of the most intelligent farmers, that when cake can be purchased at the same price per ton, in pounds, that beef and mutton can be sold at per stone in shillings, it will be paid for in the cattle and animals fed, without reference to the manure. The price of cake, however, depends on no such element of calculation. The demand for it has become far greater than that of the oil; and, in some seasons, it has been so great, that the former became an object of commerce rather than the latter, and realised as much as twelve guineas per ton. To render the uncrushed seed available by a cooking process, attempts have occasionally been made; but it has generally been found better adapted for calves than for store-stock or for fattening. Where used at all for the latter purpose, it has only been to supply a deficiency in turnips, when the crops of these have failed, and when the other has had to be substituted for them.

The most decisive step ever taken in the use of cooked linseed, was by Mr. Warnes, of Trimmingham, near North Walsham, in Norfolk. He commenced by inquiring into the nature of cake, which he found to be nothing more than the refuse of linseed; and immediately commenced a series of experiments with linseed, crushed, steeped, boiled, and cooked in various ways. He also tried the

effect of boiled barley, and other food on various animals. These ultimately led him to adopt a mode of feeding on what he termed linseed compound. This was carried out in connection with his experiments in growing, dressing, and preparing the flax, the feeding of his cattle with the prepared seed, which he put into boxes as being opposite to tying up, and to the summer grazing by soiling.

These processes excited much attention, not only in England, but also in Scotland and Ireland, and were the cause of many visits being paid to Trimmingham, that agriculturists might see for themselves. On such occasions, Mr. Warnes was by no means niggardly, either in his hospitality, or in laying the whole secret of his experience before his visitors. Among these was Mr. Milburn, who describes the cooking apparatus as so simple, "that it is managed by a blind man, whose happy countenance bespeaks neither over-weening anxiety nor unremunerated toil. The apparatus consists of two cast-metal boilers, fixed in brick, with a fire-place beneath them. The water is made to boil before the linseed is put in. The seed is crushed by a very powerful implement, made by Messrs. Harwood, of Ipswich, consisting of two cylinders, one of them of large diameter. They are made to press upon each other in their revolutions by two lunar springs; and two men will thoroughly grind two bushels in ten minutes. At this rate the men are able to work the whole day. The mill is, however, capable of being reduced to the capacity of one man. The crushed linseed is sprinkled upon the boiling water at the rate of one gallon of seed to eight gallons of water. Great stress is laid on sprinkling the linseed very gradually; otherwise, it is apt to adhere in lumps, and cleave to the sides or bottom of the boiler. With this precaution, however, Mr. Warnes assures us that he has had no instance for several years of this occurrence. This mixture is boiled six minutes, and for that period is slightly stirred. At the end of that time it is found to be a thick gelatinous mass. In about one minute the mass appeared more mucilaginous, and we think was improved. Nine bushels of cut pea-straw were then placed very gradually, and by one bushel at a time, in a tub twenty-eight inches high. The liquid jelly was now taken out in the scoop, and poured upon it. As each addition was made, the whole was rammed down by a kind of beater, more for the purpose of mixing the mass, and confining the heat, than for any other object. The present cost of the animals in linseed, is 3*s.* per head per week. In addition to this, they have about one bushel of cut Swedes per day. The animals to which Mr. Warnes at present gives the compound, are seven cattle, nine horses, and forty sheep. Occasionally he mixes his compound with corn, or rather with meal. This, when used, is also sprinkled over the boiling mucilage; but when we saw the process, corn was not used. So soon as the first boiling was nearly emptied from the boiler, it was again filled with water, and was ready for another boil when required."

As a test of the value of his system, Mr. Warnes furnished the following remarks and experiments, as illustrative of the general effects:—"Linseed," he says, "has five essential properties—viz., mucilage, oil, albumen, gluten, and sugar. The shell, or external crust, is the hardest of all seeds, and the most difficult to break in pieces; but not too hard for the miller, who has every particle ground almost to powder, in order that all the oil may be expressed, which it could not be if coarsely crushed. This is demonstrated by the cake, in which the presence of linseed is scarcely apparent. To a similar state, linseed for the cattle compounds ought to be reduced; otherwise some, at least, of the properties above described, will pass off without benefit to the fattening animals. This the scientific grazier will discover by the excrements, in which he will find sufficient cause not only for grinding linseed, but also for grinding all grain or pulse, if possible, into flour. From researches like these, the profitable returns for grazing upon my premises may be dated—returns such as are represented by the following figures:—

	£	s.	d.		£	s.	d.
7 Durham bullocks cost . .	59	10	0	Sold within six months for .	136	10	0
10 Scotch ditto . .	190	0	0	Ditto ditto . .	215	0	0
1 Cow	5	5	0	Ditto ditto . .	15	0	0
10 Miscellaneous small cattle . .	40	5	0	Sold within nine months for .	136	0	0
Balance down . .	297	10	0				
	£502	10	0		£502	10	0
					£297	10	0
Deduct for 14 qrs. of linseed, mostly grown upon the farm, £35; and £4 for barley meal					£39	0	0
Return for 19 acres of turnips, several acres of pea straw, and about 3 months' autumnal grass for the 10 miscellaneous cattle					£258	10	0

"The linseed, with the pea-straw and turnip-tops, were formed into compound, the turnips given raw, and the barley-meal as circumstances required. Under the old system, the turnip-tops would have been mainly destroyed, and the pea-straw used for litter. But these having been employed as above described, will account for the small consumption of turnips, and show the immense importance of such auxiliaries." The expense of this copper, with the whole working apparatus for eighty or a hundred head of stock, was not more than £4. Every farmer will, we think, see, from this small outlay, the great advantage which the possession of such an apparatus gives over almost that of every other kind; whilst the labour necessary to work it in an efficient manner, is, comparatively speaking, easy and light, and, at the same time, requires very little skill.

Feeding in boxes, the growth of linseed, the manufacture of the fibre into flax, and the soiling of cattle with green food and compound in the summer, all entered into the system of Mr. Warnes, whose experiments induced trials with all kinds of modifications of linseed-cooking; but the one which obtained the greatest amount of favour, was that adopted by Mr. Marshall, late of Holme Lodge, near Thirsk. The difference between Mr. Marshall's plan and that of Mr. Warnes was, that the material cooked had not the heat applied to it directly, but to the outside of the boiler in which it was to be cooked, so that no direct application of the fire took place to burn the mucilaginous matter. Mr. Marshall insisted that, to cook the material properly, it must be boiled at least two hours. His mode was this:—One pound of linseed was boiled for two or three hours in about one gallon and a-half of water. Five pounds of straw were chopped to about the length of an inch, and very intimately mixed with two pounds and a-half of ground oat or barley-meal, which were then placed on a floor of flags or bricks, and the boiled linseed poured upon the mass and turned. It was, after this, allowed to cool for one or two hours, when it was ready to be given to the cattle. The subjoined calculations are given for one animal; though the food for a larger number may be cooked at the same time, and in the same proportions. Supposing the linseed to be six shillings per bushel, the cost for each animal, per week, will stand thus:—

	s.	d.
12 lbs. 6oz. of linseed per week . .	1	4½
32 lbs. of corn, at 11½d. per stone .	2	2
Labour divided per head . . .	0	0
Coals	0	0
Interest of cost of apparatus . .	0	7½
	4	2½

Another gentleman who carried out the scheme very fully, gave the following experiment with the linseed compound, as compared with oil-cake. In this the turnips were charged, as well as the compound, to make the terms equal. Sixteen polled beasts (cows) were taken up. They were divided into two lots, and each lot consisted of eight beasts, as nearly equal, in weight and condition, to the other as possible. One lot, costing 6s. 10d. per head was fed as follows:—

	s.	d.
Linseed cake, 3 stones, at 13½d. per stone	3	4½
Turnips, 980 lbs.	3	0
Labour	0	5½
Per week for each head . .	6	10

The other lot was fed upon prepared food:—

Linseed and ground corn . . .	4	4
Turnips, 490 lbs.	1	6
Labour, &c.	0	5½
Coals	0	6
Per week for each head . .	6	9½

The two lots were sold on two different days; four being taken from one set of beasts, and four from the other set, at each sale. The cattle fed upon prepared food realised £2 6s. 6d. more than the others, and the time occupied in feeding them was eight weeks.

A Yorkshire agriculturist, of great skill, made some very important experiments on the relative value of *hot and cold preparation* of linseed. He took two animals, and, after ascertaining their exact weight, fed the one on hot and the other on cold food. At the expiration of six weeks they were weighed again. The animal fed on cold food weighed, when put up, 107 stones 11 lbs.; that fed on hot, 108 stones 7 pounds. At the end of the six weeks, the first had gained 2 stones 12 lbs.; while the other fed on hot food, had gained 5 stones 1 pound. To guard against the one having any special aptitude to fatten more readily

than the other, he reversed the order; and it turned out that the animal now fed on cold food, and before on hot, gained 3 stones 1 lb.; while the other, now fed on hot food, and before on cold, gained 5 stones 11 lbs.! But this was not all. While the one fed on hot food had only 5 stones 10 lbs. of Swedish turnips per day, the one fed on cold food was not satisfied till his feed was increased to 7 stones of turnips in the same time, thus showing a greater consumption of other food to make up for the want of heat!

WEIGHT AND MEASUREMENT OF CATTLE.

To estimate the weight and measurement of cattle by the senses of feeling and sight, is not so easy an operation as some might suppose. Indeed, it is so difficult a matter, that many farmers, even of large experience, are unable to perform the task with anything like accuracy. A somewhat distant approximation is all they can accomplish. Whilst this is the case with the farmer who may not be moving quite in the capacity of grazier, this latter has a still more difficult duty to perform. He has to purchase lean animals at a market or fair, and to estimate their feeding qualities. He has besides to calculate the stones they will weigh when fat. It is all a money-calculating process. On an average the farmer requires to make £5 for grazing an ordinary sized animal during the summer. Good grass will feed one beast on an acre, and thus remunerate the farmer. When beef is 5*s.* per stone, the grazier must increase the weight by twenty stones, in order to make his animals remunerative. Hence, if he sees a beast which, in his estimation, has frame and capabilities to weigh fifty stones, he ought not to give more for it than £7 5*s.* But this price will not compensate the breeder; therefore he and the grazier must both suffer when the price is only 5*s.* per stone.

The various elements which enter into the calculation of the weight of animals, are breed, quality, age, degree of fatness, quality of food, duration of feeding, &c. Of some of these the buyer may be able to judge, but of others he can form no idea. He may conceive the breed to be good, the age to be proper, and the quality such as he wants; he may even find the animal well fed up, both as to quality and food; but he may still be deficient in the requisite knowledge. The *offals* of cattle have also a material influence in regulating the price. There was a time when the hide and tallow would be an ample profit to the butcher; but that is past, and he must now sell the best cuts of meat at more per pound than he gives for the whole, or he will be a loser of his fair share of profits.

The offal of ordinary beasts may be estimated as follows:—

	Stones.
Hide, tail, and horns	5
Tallow	4
Head, &c.	2
Heart, and eatable portions	11
Lights, liver, &c.	2
Blood	4
Bag and entrails, with contents	14

Mr. Ewart, of Newcastle, who paid very great attention to this subject, and whose slide-rule and cattle-gauge obtained for him a degree of merit for skill which his labours well merited, drew up a scale of per-centages, which may be considered as a sort of standard. He classes animals as to their peculiar properties; and, in his first class, included the following:—

First Class.—Short-horns, Herefords, Suffolks, and Devons. Their per-centage of fat to live weight, he thus estimated:—

	Beef.		Live Weight.
Half fat	55	to	59
Moderately fat	60	„	62
Prime, to very fat	63	„	66
Extraordinarily fat	67	„	70

Second Class.—Craven, Lancashire and Irish short-horns, Lincolnshire, Galloway, Angus, Aberdeenshire, Fifeshire, Norfolk, and better sorts of Welsh:—

	Beef.		Live Weight.
Half fat	50	to	55
Moderately fat	56	„	60
Prime to very fat	61	„	63
Extraordinarily fat	64	„	66

Third Class.—Argyleshire, Highland, and mountain breeds:—

	Beef.		Live Weight.
Half fat	48	to	50
Moderately fat	51	„	55
Prime, to very fat	57	„	60
Extraordinarily fat	61	„	66

These estimates may help the buyer who has not had experience sufficient to enable

him to judge of the carcass-weight of the animal he wishes to make his own. Let him have it weighed, and make a deduction according to the foregoing data; and if it does nothing, more, it will at least serve as some guide in the forming of his judgment. The author of *The Book of the Farm*, gives two rules for ascertaining the weight of cattle by *admeasurement*. He confesses, however, that they are not founded on any certain principle—a circumstance which must be remembered in using them.

1st. Multiply the square of the girth in inches, by the length in inches, and divide the product by 7344; and the quotient will be the weight in imperial stones. 2nd. Square the girth in feet, and multiply it by the length in feet; multiply again by the decimal ·238, and the sum is the weight in imperial stones. By the *length*, in all admeasurement, is intended a line from the top of the shoulder to the setting-on of the tail; and the circumference round the body, just behind the shoulders, is the *girth*. The same author remarks, that for beasts between forty and seventy stones, the rules of admeasurement apply pretty nearly; but below or above these weights, they cannot at all be depended upon.

The following approved rule is given in the little work of Mr. Milburn:—"Measure the girth close behind the shoulder, and the length from the fore part of the shoulder-blade, along the back, to the bone at the tail, which is in a vertical line with the buttock, both in feet. Multiply the square of the girth, expressed in feet, by five times the length, and divide the product by 21: the quotient is the weight nearly of the four quarters, in imperial stones, of 14lbs. avoirdupois. For example, if the girth be 6½ feet, and the length 5¼ feet, we shall have 6½ multiplied by 6½, making 42¼; and 5¼ multiplied by 5, making 26¼; then 42¼ multiplied by 26¼, making 1,109·6; and this, divided by 21, gives 52·84 stones, nearly, or 52 stones 11lb. It is to be observed, however, that in very fat cattle, the four quarters will be about one-twentieth more; while in those in a very lean state, they will be about one-twentieth less than the weight obtained by this rule. The four quarters are little more than half the weight of the living animal; the skin weighing about the eighteenth part, and the tallow about the twelfth part of the whole."

FEEDING FOR THE DAIRY.

To the practical man, the influence which food exercises on the production of milk is well known. Not only is the daily quantity of milk produced by a cow dependent on the nature of the aliment consumed, but, also, the quality of the milk is greatly affected by its character. Butter and cheese may be regarded as two very important articles of dairy husbandry, and they are both the products of milk. According to the purpose for which this wholesome beverage is intended to be employed—whether for the manufacture of butter or the making of cheese—the cow should be differently fed. Chemistry has given us a knowledge of the fact, that butter contains carbon, hydrogen, and oxygen, but no nitrogen; whilst, with this last element, cheese is abundantly supplied. Food which contains a large quantity of fatty matter, or such substances as are, in the animal system, readily converted into fat, will tend to the increase of the proportion of cream in milk. On the other hand, the proportion of caseine, or cheese matter in milk, is increased by the use of highly nitrogenised food. Those, therefore, who desire much cream, or who produce milk for the manufacture of butter, direct their attention to the selection of food likely to increase the proportion of butter in the milk. In cheese countries, on the contrary, the principal object of the farmer is the production of milk rich in curd. Vetches, clover, peas, and bean-meal, abound in legumen—a nitrogenised organic compound, almost identical in composition and properties with caseine, or the substance which forms the curd in milk. The dairy farmer, consequently, feeds his cows with advantage with such and similar food as tends to add to the richness of the milk in curd or cheese. The quality, as well as the quantity, of the butter in the milk, depends on the kind of food consumed, and on the general state of health of the cow. House-fed animals, particularly if turnips is their principal food, always yield inferior butter to cows living upon the fresh and aromatic grasses of pasture-land. Succulent aliment, in which there is an abundance of water, such as the green grass of irrigated meadows, green clover, brewers' refuse, distillery refuse, &c., increase the quan-

tity rather than the quality of the milk. The town dairyman who sells his new milk to daily customers, increases the bulk of his milk by such succulent food, and thus renders it thin, without afterwards diluting it with water.

In the *Cyclopædia of Agriculture*, an account is given of the cost of producing a gallon of milk, according to different modes; and, though it may be a somewhat vague instance, it so nearly approximates to the spirit of truth, that we deem it worthy of being laid before the reader.

The Gloucestershire system, where the cows are fed on grass and hay, and sold lean when unfit for dairy purposes, involves a cost, per gallon of milk, of 6⅛*d*. The Cheshire system, in which a few turnips are added in the winter keep, costs 6½*d*. The Fifeshire system, of grass pasture in summer, and nine tons and a-half of turnips in the winter, with oat-straw, amounts to 3⅞*d*.; and Mr. Young's plan, in the same county, with a more liberal allowance of extra food, as bean-meal, linseed, &c., costs 5⅝*d*. Now, though we might have expected a greater difference in the last two cases, and in favour of the very last in preference to the former, we still see that it is the dearest way of all to starve the cows; and that a moderate degree of attention and care is necessary to the most economical produce of the milk-cow, whether it be in milk or butter. When the pastures begin to fail, it is usual to turn the cow upon the fog or aftermath—say in the month of October—for nearly all cow-keepers have, of necessity, a quantity of grass-land producing hay; and the after-eatage of this land affords the best possible food for the milk-cow, whether butter or cheese be the object sought by the dairyman. When this runs short, a little "hand-meat"—a few turnip-tops, or rape, or even a little bran-mash—will be well bestowed; for if the milk does go down at this period, it is never regained in winter by any care which can be exercised. If town milk is the object, a few brewers' grains would be the most advisable addition to the catage which could be made. If the weather should still be open and favourable, the pasture, freed in October, will have grown up a little, and will afford a very useful turn-out for the cow; for she must, usually, be housed at night, when the fog is finished. In the house, she should either have hay and mangel-wurzel or turnips; or, if she have straw, she should have cooked linseed, or oat or bean-meal mash. The chaff of the barn, after winnowing, may be collected, as free from dust as possible; or, if mixed therewith, it may be sifted and laid by. A bushel of linseed may be added to two bushels of barley or oats, or even wheat, or any other grain, grown in the ordinary way. This may be boiled in a common boiler, taking care to keep it well stirred, to prevent its "setting on" at the bottom of the boiler. After boiling a quarter of an hour, if this be poured upon the chaff in the proportion of one-and-a-half to two pounds of the meal, and a gallon of water to one bushel of chaff, one of the most useful, and certainly the cheapest adjuncts to milk-cow and store-stock feeding which can be conceived, will be adopted. The great objection to turnips, at least in large quantities, is the flavour they impart to the milk and the butter. This is a difficulty which can only be partially removed. It is surprising, however, how few turnips or roots will be required if a compound system be adopted; and this quantity being so small, it is easy to vary them, by giving potatoes, carrots, mangel-wurzel, &c., in an ever-changing round. It is a question whether hay need ever be given, if this system be adopted. If it be not, the cows must have a liberal allowance of hay. In Norfolk, oats, barley, or bean-meal, is mixed with chopped hay. It is questionable, however, whether the cow has not more gratification, and hence more advantage, from selecting and masticating the hay alone, than can be derived from the cutting and mixture, which at least is a costly and laborious process. A small quantity and a great variety of food will, on the whole, produce the most favourable effect on milk-cows. In a Prize Essay of the Yorkshire Agricultural Society, the Rev. Robert Pulleine, of Kirby Wiske, thus describes his very successful method of keeping dairy-cows in winter:—"In the management of dairy-cows, during the winter season, it is of the greatest importance to have a dry, well-ventilated cow-house. The side walls should not be less than seven feet in height; and, in the two courses immediately below the top course, every alternate brick should be left out to insure a sufficient ventilation. A rough board,

on a couple of hinges, may be fitted to close the openings, in case of very severe weather; but I have never required it. The floor on which the cows stand should be made of well-beaten soil, and behind them a kerb-stone, about three inches thick and twelve inches wide, to raise them above the channel, which should have a slight fall, to carry off the water at once. My cows are tied up in pairs; each pair having a space of eight feet by six feet six inches, which is sufficient room for any beasts under sixty stones' weight. They have a crib before them, nine inches deep by twenty inches wide, raised upon twelve inches of brickwork. The advantage of the crib being raised is, that the cows are less liable to get turnips into their throats than when they have to put their heads down to the ground for their food. A rack I consider of little moment, as the hay is all given as chop. It is a good plan to take up cows as soon as the nights become cold—say the middle of October—as the white frosts, which occur about that time, cause them to run off their milk. They are turned out during the day until the middle of November, if the weather keep fine. From that period, until May-day, they are kept entirely in the house, except being turned out a few minutes every afternoon to water. They are milked at half-past five o'clock, morning and evening. As soon as the man who feeds them comes in the morning, the dung is all removed, and each cow has a feed of 28 lbs. of roots:—

"At 7	o'clock	7 lbs. chopped hay.
„ 9	„	A pail of water, with ½ lb. of bean-meal stirred into it.
„ 10	„	2 lbs. of linseed cake.
„ 1	„ (P.M.)	7 lbs. chopped hay.
„ 2	„	Turned out to water, and then 2 lbs. of linseed cake.
„ 5	„	28 lbs. roots.
„ 8	„	7 lbs. chopped hay."

One of the first requisites, in a successful dairy cow-house, is cleanliness. Without this, a dairy is anything but what it should be. It must be kept free from smells of all descriptions; frequently washed and whitewashed; and the animals diligently rubbed, and even curried. A thriving cow, out of doors, is known by her having the marks of her tongue upon her skin. If she is not at liberty to lick her own skin, she should, at least, have it done for her. Her litter should be removed the first thing in the morning, and replaced by fresh clean straw. Above all, she cannot have too much air, if the cold blast be judiciously cut off. But to exposure is, the crowding of cows in close places is considerably owing. There should be ventilators at the top of the cow-house, in the Louvre style; open fronts to the south, capable of shutting up in snow or southern rain; and capacious ventilators at the bottom, by grates or ventilating bricks, are indispensable to the health of the animals. If these be neglected there can be no hope of health or success in the dairy.

Respecting the influence of the food on the character and quantity of the milk, to which, in the opening paragraph of this chapter, we have alluded, several experiments have been made. Among these, a scientific agriculturist furnished Mr. Milburn with one, which showed that the increase of milk, within certain limits, was almost in the power of the Farmer, by an addition of bean-meal to the ordinary root food and hay. Although, as a general rule, milk may be produced by these costly and stimulative kinds of food at too great an expense, yet it is of great importance, in a particular season, or under special circumstances, to know the means of increasing the supply beyond the ordinary quantity. Two Ayrshire cows were selected by Professor Thomson, and fed with malt in various combinations, when it was found that 100 lbs. of barley, hay, and grass, produced 8·17 lbs. of milk; and that the same quantity of malt and hay, produced 7·95 lbs. of milk; the former yielding 1·95 lbs. of butter, and the latter 1·92. Although this was not at all satisfactory as to the value, or otherwise, of malt for milk cows, still, it shows how food may influence the quantity and quality of the milk. Messrs. Dumas and Boussingault also experimented upon this subject. They made a number of very careful and interesting investigations regarding the quantity of milk and its products which would be given by cows fed on different kinds of food. They tried nearly all the combinations usually given, except, perhaps, bean-meal; and the result was, that, in every case, the greatest quantity was produced when the cow had green clover; thus proving that, in each instance, this yielded the greatest quantity

of butter; and, with one exception, the greatest produce also of cheese; and that exception was when the cow was but one day after calving, which accounted for the abundance of cheesy matter in the milk. The table is full of instruction, and justifies the quotation of some of its items.

Food.	Days after calving.	Milk.	Butter.	Cheese.
Potatoes and hay . .	176	9·3	4·8	3·3
Hay and green clover	182	8·9	4·5	4·0
Green clover . . .	193	9·8	2·2	4·0
Clover in flower . .	204	7·8	3·5	3·7
Potatoes	229	5·0	4·0	3·4
Turnips	207	6·0	4·2	3·0
Red beet	215	5·6	4·0	3·4

It is found that mangel-wurzel, bean-meal, and grains, largely contribute to the increase of milk; that good hay and oat mash augment the quantity of butter; and that turnips, though they sometimes impart a disagreeable flavour, materially add to the increase of both.

The result of Mr. Pulleine's system of management, in the production of milk, is as follows; the cows being five in number, viz.—

1. Yorkshire, 9 years old; had her last calf March, 1850.
2. Alderney, 2½ years old; calved July, 1850.
3. Yorkshire, 2½ years old; calved Nov., 1850.
4. Yorkshire, 5 years old; calved Jan., 1851.
5. Ayrshire, 6 years old; calved March, 1851.

He says—"It will be observed that Nos. 1 and 2 can hardly be called in full milk, and No. 3 is only a quey. They produced, in the seven weeks, from the 25th of March to the 10th of May, 191 rolls of butter, 24 oz. to the roll, equal to about 254 lbs., 16 oz. to the pound. To this must be added 154 quarts of new milk, and 42 quarts of cream, consumed in the house. The milk was not regularly measured, but averaged about sixty quarts per day."

It is sometimes an object to keep the cow as long as possible in milk. Some cows get dry early; whilst others may be milked through, though always with disadvantage to both her and her calf—both being feeble and impaired, if it be persisted in. In summer weather, however, when cows are in high condition, and good milkers, it is not only sometimes advisable, but absolutely necessary. A cow not put to the bull will hold her milk much longer than one which is regularly breeding.

The *spaying* of milk cows is adopted by the veterinary schools of France; and much has been said in its favour by various continental authorities. A report on this subject was furnished to the Academy of Rheims, by M. P. Charlier, which spoke almost exclusively in its favour. The practice is an old one in both Germany and England. The object is supposed to be to increase the feeding propensities of the animals, but by no means for the purpose to which we refer, and which mainly occupies the attention of the French veterinary school—viz., the prolonging of the period of lactation. The report, which is very voluminous, furnishes a variety of experiments made on cows, old and young—some as far advanced in age as eighteen years; but, in order to realise all the promised advantages, the cow is said to be best when from four to eight years old. The operation is performed on the right side, and does not, altogether, occupy more than from four to ten minutes. It is seldom fatal, unless the cow is in calf. In some instances, the cows are said to go and feed as usual, even after the operation.

"The conclusions from the above report, endorsed by the reward of the society's medal, were—that *spaying* increases the supply of milk from the animal after a few days; that there is a steady return of milk of the best quality, less liability to fall off milk, and no troublesome tendency to desire the bull; that in eighteen months the milk does not diminish; that the feeding tendencies of the cow are much increased, and the quality of the beef improved. Nay, it is further said, that in one dairy (the number of the cows not being given), a difference between spayed and unspayed cows, in milk, was 850 pints per annum; no great quantity, however, if it were a considerable dairy, and where, possibly, the best cows were spayed. There is, we must confess, a barbarity about this practice—needless, we believe—which makes our kinder feelings revolt at an operation performed for so little advantage, over the gentle, patient, harmless milk cow."

REARING CALVES.

The rearing of calves is more or less pursued on every dairy farm; and, although every cow does not annually produce young, still heifers are usually put to the bull at two years old,

and the period of gestation varies from 275 to 290 days. Therefore, the old-fashioned mode, of reckoning three months back in the almanac, is not a difficult way of knowing the date at which a cow, put to the bull, may be expected to calve. She is nearly three years old when she produces her first calf, which is very often the produce of a very indifferent sire. In about six weeks after calving, the cow will be ready to take the bull again, although she may not hold; and if the month of June be suffered to expire before she is covered, she will be likely to calve at a time when it will be unprofitable to the breeder. Sometimes only the tenth of the cows of the dairyman are in calf, when he loses both milk and produce; but whether the cows are in calf, or only in an excited state, every twenty-one days it has a very unfavourable effect on the milk. To arrest this evil, numerous remedies have been suggested; among which are confinement, bleeding, abstinence at the time of bulling, or not permitting to have the bull for one return of the season. Some drench the cows with a pailful of cold water after the cow has been served, and some change the bull. Thus, every one has his own peculiar mode of acting, and, no doubt, every one thinks his own remedy the best. Where the loins are to be served, however, it is desirable to have this done in the morning, previous to milking. But sometimes the cow will not get into season; and here also the skill and ingenuity of mankind have been sorely tried in order to force her into an excited condition. Some try one thing, and some another; but, perhaps, the best plan to adopt is, to give the animal a quart of the milk of a cow that is in season; after this, it is said that, in three weeks, she will be ready for the bull, and a second return will be productive.

After the calf is produced, as a matter of course, it requires to be fed with such aliment as nature, at the commencement of life, has provided for it. No food, therefore, is better for the sucking animal than milk. In this it finds proteine compounds, or, in other words, flesh-forming substances, to supply materials for the development of muscle; lime and phosphoric acid, from which the inorganic part of the bones is formed; alkaline salts, which enter so largely into the composition of blood and other animal juices; sugar and fatty matters to supply the waste of carbon, which is thrown off during respiration, in the form of carbonic acid. Milk thus contains, within itself, all the elements necessary to the support of life, and, from this circumstance, is justly considered a most nutritious, as it is an universal food. The sucking animal is, by nature, created to suck this beverage, and is supported by it for a length of time, which varies in the young of different animals. There can be no doubt, that if the animal is too early deprived of the milk of its mother, it will suffer in its growth. On the other hand, the addition of milk to other food, properly proportioned to the necessities of the growing animal, promotes its growth, and assists in strengthening its constitution in a more than ordinary degree. Beyond a certain period, however, milk diet alone cannot be continued with profit; for it must be remembered that herbivorous animals naturally require a bulky food to preserve them in good condition. Young animals must gradually be reared on a more solid food than milk, as it is essential to stimulate all the different parts of the alimentary canal to a healthy activity. To bring up a calf for the butcher, is by no means a difficult process. It is only necessary to allow it to suck its mother for the requisite number of weeks, until it has attained to the size and fatness suitable to the judgment of the buyer and the taste of the consumer.

"The materials usually employed for solid food," says the author of *The Cow*, "are, new milk, skimmed milk, meal-porridge, linseed-tea, and hay, grass, turnips, meal, potatoes, mangel-wurzel, &c. Some breeders—whose object is the calf, and the calf alone—sacrifice every other consideration to this. The breeders of short-horns, whose early maturity require a corresponding early supply of nutritious food, generally apply nature's own provision, and allow the calves to suck either their mother, or some other dam, or in some cases more than one cow, in order that they may develop their precocious and distinctive qualities. This practice they often continue for six or twelve months. It is, however, an expensive mode of feeding for those who rear only ordinary cattle for the market. Moreover, some are so 'stingy,' that as soon as the

cow ceases to give 'beesting,' they begin to give the calves skimmed milk. A process of this kind does irreparable injury to the young animal.

"The best mode, with ordinary calves, is to give new milk for at least fourteen days after the calving. There are two modes of doing this: either to allow them to suck the dam, or to remove them as soon as calved, but train them to drink in the first instance. For ourselves, we think that taking away the calf is both cruel and unnatural. The healthiness of the mother, we consider, depends upon it. We invariably allow the presence of the calf for at least a fortnight. We suffer the mother to lick over the whole of her offspring, because we think that a privation of this medicine of nature, is a cause of many a valuable animal being lost. After the first fourteen days, we mix one-half new, and one-half skimmed milk, for fourteen days more; this skimmed milk is scalded nearly to the boiling point, set aside to cool, and given to the animal. One great secret in the successful rearing of calves, is to give them frequently small quantities of food at a time. For the first fortnight the calf ought to be fed, at least, four times per day. About a quart at a time will be necessary; which quantity may be increased afterwards, as the animal's wants may require it. Soon after this the skim-milk time commences, when the animal, if properly trained, will begin to eat the solid food." In young and growing stock, the process of renewing, or building up the system, proceeds much more rapidly than it does in the full-grown animal. Science, therefore, has demonstrated that the food should contain a large supply of flesh-forming principles, and of phosphates, from which the bones are formed. These are plentifully supplied to the animal by the grain of barley, oats, and wheat, which also contain large proportions of gluten, albumen, and other nitrogenised organic compounds, which supply the young animal with the materials of which the muscles consist. In peas and beans there are still larger proportions of muscle-making materials. The addition of these in a state reduced to meal, to the food of growing stock, if not otherwise detrimental to the general health, will have great influence in accelerating the growth of the fleshy parts. On the whole, then, it may be concluded that the young and growing stock require a more concentrated food than is required by animals which have arrived at maturity. The plan of Mr. Huxtable has been very freely discussed, as it proposed to accomplish the feeding of calves at a much cheaper rate than was usually done by other breeders. We subjoin his mode, with that of Mr. Nicholson, a Scotch breeder.

THE PLAN OF MR. HUXTABLE.

	£	s.	d.	£	s.	d.
First month:—						
Two quarts of new milk daily, at 1½*d.* per quart, for each week	0	1	9			
Six quarts of skim-milk daily	0	1	3½			
	0	3	0½			
			4			
				0	12	2
Second month:—						
One quart of new milk daily	0	0	10½			
Five quarts of skim-milk	0	1	1¼			
Half a pound of oil-cake	0	0	8			
	0	2	7¾			
			4			
				0	10	7
Subsequent cost, viz.:—						
From third to twelfth month, 150 lbs. of cake, at £7 per ton				2	15	0
During last six months of second year, 2 lbs. of bean-meal daily				1	2	0
Attendance for two years				1	14	10
Calf born on farm; price if then sold				0	9	0
Total				£7	3	7

THE SCOTTISH PLAN OF MR. NICHOLSON.

	£	s.	d.
Forty-five days' milk, four quarts, at 1½*d.*	1	2	6
Mixed gruel—wheat and linseed, four quarts, at 0½*d.*	0	7	6
Forty-five days of the same mixture in double quantity	0	15	0
Hay, cake, and turnips, at 1*d.*	0	3	9
Grass from June 1st to October 15th, at 10*d.* per week	0	15	10
Second summer's grass	2	0	0
Ninety days' oil-cake, 3 lbs. daily, at £7 per ton	0	16	8
Price of calf, if bought	1	10	0
Loss from death, at 10 per cent., on £6 13*s.* 7*d.*	0	13	0
Attendance for two years	1	0	0
Total cost	£9	4	3

In drawing this chapter to a close, we must

recommend that especial attention to cleanliness in the keeping of all animals, whether old or young, should form an essential portion of the duty of their keepers. In the earlier stages of the life of the calf, it is extremely bad policy to stint it in its food. "That calf," says the author of *The Cow*, "may be said to be always fat which never loses its first layer; and, as the difference is often a question in after-fattening, of some six months of keep, there can be no question that it is of the greatest importance to keep it well at first. Giving the calf that food which is easy of digestion, and suited to its feeble stomach, in early life, allowing it especially its mother's milk, the beestings and the soothing influence of its mother's tongue—weaning it from new milk gradually and cautiously, with a plentiful allowance of good sweet hay, are the real elements of success in calf breeding. This course, with a proper attention to air, warmth, exercise, and cleanliness, is all that is required in the proper management of young calves; and will generally be found sufficient for their health."

CHAPTER V.

MANAGEMENT OF THE DAIRY.—GENERAL OBSERVATIONS; BUTTER AND CHEESE; THE ART OF MILKING; PRESERVATION OF MILK; THE DAIRY.

GENERAL OBSERVATIONS.

Amongst the almost endless varieties of form in which food is used for the sustenance of animal life, there is none in which it appears to be so universal as in that of milk. In this form this liquid assumes the utmost importance. It is the first aliment with which the young of the whole class of the mammalia of natural history is nourished. The lactiferous teats are, to these, the earliest objects of their search; and the instinctive power with which nature has supplied them to seek, find, and use them, so soon after their birth, is one of the very remarkable phenomena which have excited the wonder of mankind. As the food of the rustic, as well as the citizen, it also takes a prominent place. To the young especially it is exceedingly grateful; whilst, in the shape of cream, it flavours the coffee and the tea of the peer, as well as the plough-boy. Its butter is spread over their bread, and softens and enriches their pastry. In the form of cheese it becomes the diet of the poor, and, in the same form, frequently finishes the repast of the wealthy. A beverage, therefore, so agreeable in itself, and so universally valuable in its products, has necessarily, in all ages, received a high share of consideration in the sight of mankind. In the females of the class mammalia, it is white and opaque, having a sweetish taste, and a specific gravity somewhat greater than that of water. When it is allowed to remain at rest, it separates into a thick white fluid, called cream, which collects on the surface, and the fluid beneath which is more watery. The quantity of cream obtained from milk, and the time it requires to separate, vary according to the nature of the milk, and the temperature of the atmosphere. When the milk is allowed to stand after the spontaneous separation of the cream, it first becomes acescent, and then coagulates. When the coagulum is pressed gently, a serous fluid is forced out, and the remainder is the caseous part, or pure cheese.

BUTTER AND CHEESE.

Butter and cheese are obtained artificially: the former by the operation of churning; and the milk which remains after the butter has been separated, or, as it is called, the buttermilk, has all the properties of milk from which the cream has been separated. Cheese is obtained by the addition of rennet to the milk, which is prepared by digesting the inner coat of the stomach of young sucking animals, especially that of the calf. The quality of the

cheese depends upon the quantity of cream remaining in the milk. The best cheese is obtained by coagulating the milk at the temperature of 100°, and expressing the whey slowly and gradually, without breaking down the curd. Whey expressed from coagulated milk, if boiled, and the whole curd precipitated, becomes transparent and colourless. By slow evaporation it deposits crystals of sugar, with some muriate of potash, muriate of soda, and phosphate of lime. The liquid which remains, after the separation of the salts, is converted, by cooling, into a gelatinous substance. If whey be kept, it becomes sour by the formation of the lactic acid; and it is to this that the spontaneous coagulation of milk is owing. Milk may, after it is sour, be fermented, and it will yield a vinous intoxicating liquor; it is likewise susceptible of the acetous fermentation. In the former state it is used by some of the inhabitants of the north-east of Asia, for intoxicating purposes. The constituent parts which enter into the composition of milk, are water, oil, curd, gelatine, sugar of milk, muriate of soda, muriate of potash, phosphate of lime, and sulphur.

The milk of various animals is composed of nearly the same substances; but the proportions vary so much as to give them very different properties. Every kind of milk produces cream. In that of the cow it is copious, thick, and yellow. Goat's milk produces abundance, and it is thicker and whiter than that of the cow. Ewe's milk produces as much as that of the cow, and of nearly the same colour. The cream from asses' milk is white and liquid. In mare's milk it is very fluid, and similar in colour and consistence to good cow's milk before the cream appears on the surface. Butter obtained from the milk of the cow differs in colour, but has always much consistency. The butter of asses' milk is white and soft, and disposed to be rancid. That from goat's milk is abundant, white, and soft. That from ewe's milk is yellow and soft; that from mare's milk has little consistence, and is readily decomposed. The caseous part of milk varies in different animals. That from the milk of the cow is bulky, and retains much serum. The curd of asses' milk has but a small portion of whey; it is not unctuous. Curd from the milk of the goat is abundant, of a firmer consistence than that of the cow, and retains less whey. Curd from ewe's milk is fat and viscid; that from mare's milk is very similar to what is obtained from the milk of the ass. The serum, or whey, constitutes a great proportion of the milk. That from the milk of the cow has a greenish cast, and a sweet taste; containing sugar of milk and neutral salts. The whey of asses' milk is colourless, and contains less salts and more sugar than that of the cow. Whey of the goat is yellowish, and contains very little sugar and saline matter. The latter is muriate of lime. The whey of ewe's milk is always colourless, and contains the smallest quantity of sugar, and but a small portion of muriate and phosphate of lime. That of mare's milk has litle colour, and contains a large proportion of saccharine matter, and of saline substances.

When milk is analysed, it is found to contain 87 parts of water, rather more than $4\frac{1}{2}$ parts of sugar, and a little more than 3 parts of butter, something beyond one-half of saline matter, and $4\frac{1}{2}$ parts of cheesy matter (curd or caseine). Its weight, whilst holding them in a state of suspension and solution, is abont 3 per cent. greater than that of water. The milk of different animals, however, as we have already hinted, contains different proportions; and this differs again according to the breed, treatment, and food of the animals. The following represents a few of these differences:—

	Cow.	Woman.	Ass.	Ewe.	Mare.
Caseine (curd)	4·5	1·5	1·8	4·5	1·6
Butter . .	3·1	3·6	0·1	4·2	trace.
Sugar . .	4·8	6·5	6·1	5·0	8·7
Salts . . .	0·6	0·5	0·3	0·7	89·6
Water . .	87·0	87·9	91·7	85·6	
	100·	100·	100·	100·	100·

The object of the dairyman is sometimes to assist, and sometimes to retard, the natural stages of decomposition into which milk will run when left to itself; and as it is sometimes necessary to defer, as it is equally necessary to hasten these degrees, all the appliances of modern art requisite to perform them are now at his disposal. Heat is necessary to all stages of this action. Hence, in winter, he can easily arrest, and, by artificial means, as easily advance the manipulations of his craft; but, in summer, it is not so easy to effect his

purpose. Thus, he has often to be in his dairy during summer, to see that the rays of the sun are not exercising an undue influence upon his milk; whilst, by other means, he endeavours to preserve it at a temperature that will keep it from receiving such injury as an improper amount of heat may cause to it. The process through which milk must be made to pass, when intended to produce butter, is not the least difficult portion of the business of the dairyman. Commencing with new milk, it is by no means necessary that the cream should be separated from it. For the production of this article, Mr. Milburn observes, that there are two different modes of breaking the globules of caseine. "One is by the application of a gradually-increasing, gentle heat to the new milk, until the buttery matter floats at the top, which is then taken almost in a boiling state, and churned to butter in a very few minutes. The other is, by at once applying the beaters of the churn to the whole mass of the milk; but, as the bulk of liquid is so much greater in the latter case than the former, and skim-milk is of greater value than butter-milk, this is much less frequently resorted to. Generally the cream is allowed time to ferment. This process aids in breaking down the structure of the enveloping skin, in precipitating the caseine of the mass, and thus assisting the maturation and development of the butter. In churning, the heat of the mass rises from 5° to 10°; and, in very cold weather, it is sometimes necessary to pour in boiling-water, in order to attain the necessary heat. This heat is also indispensable in separating the cream. At a temperature nearly freezing, it will rise with difficulty. Perhaps the most regular and healthy temperature is 55°; but, so rapidly does it rise at 76° or 77°, as to require great skill and attention to prevent the whole mass becoming sour. At the first-named temperature it will be perfectly raised in twenty-four hours; but in the latter state of the temperature it will be complete in ten or twelve hours. As the globules have to rise by specific gravity chiefly, it is desirable that the milk should be disposed in shallow dishes. Glass is clean and beautiful, and porcelain is fashionable; but lead is the old-fashioned and useful medium; it retains the heat of the hot water from the scalding process in winter, and slowly conducts the heat after the cooling from evaporation in summer. The desirable temperature in churning cream is 54° to 55°—a degree of heat preservable only in summer by early churning, and in winter by raising the temperature with boiling-water, and heating the cream at the fire before placing it in the churn, or by adding boiling-water to the mass in the churn."

Having noticed several of the different kinds of matter which milk contains, we must not overlook the smell or aroma which it sometimes emits, in accordance with the kind of food consumed by the cow. It is generally supposed that this animal feeds on buttercups, and that these must necessarily taint the butter with some degree of their natural bitterness. The cow, however, in every possible way, does its best to avoid the buttercup, which is a nauseous, bitter herb; and, in walking through pastures as bare as possible, it is left in all its luxuriance. We have frequently watched cows tearing away the grass round a buttercup plant (*Ranunculus bulbosus*), and leaving it untouched, with every particle of grass cropped close round it. Indeed, pastures may be seen apparently most luxuriant, but, on a nicer inspection, there is nothing but buttercups left. Farmers like to see buttercups, because they prefer good, sound, dry, old pastures, and the remainder of the herbage is generally good. But cows avoid them as much as possible. Along the valley of the Trent this plant remains untouched by cattle; and, during the month of May, field after field may be seen sheeted with its living gold. We do not think cattle reject it on account of its bitter character. Cows eat many bitter and disagreeable plants with avidity. There is a plant, called the bog-bane or buck-bean, which grows in marshy places, having a taste intensely bitter. In spring we have frequently noticed that the cattle tear up every particle as fast as it springs; indeed, it is eaten so fast that they never allow it to flower. There is another plant which is eaten with avidity by cattle, the flavour of which is very disagreeable—the broad-leaved garlic (*A. ursinum*). In some parts of the valley of the Trent this plant grows profusely, and flowers about the end of May, or beginning of June. At

this period it causes great annoyance to the dairy farmer, for the cows then eat it, and a very unpleasant flavour is imparted to the milk and butter. We have heard of a person who kept a cow in a meadow where it grew abundantly, and who was obliged, during the flowering season, to take her out and depasture her on the higher ground, as no sale could be met with for the butter on account of its disagreeable flavour. The milk was not discoloured, and the flavour was brought out more strongly by the process of churning.

In the case of turnips, the smell of the milk is very disagreeable; and the butter produced from the milk of a cow fed on these, will even impart a portion of its flavour to any pastry that may be made with it. In order to give butter a pleasing colour, some colouring matter is usually mixed with it. For this purpose, in most cases, annotta is used; but the best colouring is the juice of carrots, which has the advantage of being entirely free from injurious tendencies.

After a cow has calved, her milk is thick, and deeply tinged with a yellow hue, when it is termed the "beestings," or "beastings." It is then more abundantly supplied with caseine, or curd, which is sold for the purpose of making cheese-cakes. The strippings, or afterings, is the last milk which is taken from the udder of the cow, and is by far the most plentifully endued with the cheese and butter elements. From a knowledge of this fact, many dairymen make it a practice always to strip their cows themselves, notwithstanding that the principal part of the milking may have been performed by their servants.

The operation of churning is, when most quickly performed, generally most successful; but, should the cows have been long calved, and the weather cold and stormy, the process becomes considerably protracted, and instead of twenty minutes—the time allowed for a brisk turning in favourable weather—it may extend to ten, twelve, or even fourteen hours. When butter first makes its appearance, it is said to be in "skill," a technicality expressive of the caseous matter being separated from the butyraceous. When an adherence of the small particles of butter with each other commences to show itself, the rapidity of the motion must be lessened, and the butter-milk, to some extent, let off, when the gathering process will begin, and, in about ten minutes, be completed. About 55° is the best heat to churn with; but it sometimes requires more. Respecting the form of the churn, opinions differ; but the grand object in the constructing of this machine, ought to be to secure the greatest facility of operation, combined with a quick, steady, though accompanied with a trembling or quivering pressure of the contents. In churns generally, this is accomplished by various mechanical contrivances, every one of which has its merits. The most common, however, is the form of churn which has a cylinder studded with plates, pierced with holes, attached to its inner surface, revolving round a couple of axles, and admitting of one or two handles, in accordance with the weight or quantity of the cream. Another kind of churn is made with a flapper, which is, with great rapidity, driven through the cream by means of a piston, with a perforated base, and by up and down, or perpendicular motion, either in a cylinder, or vessel similarly formed. Plans have been conceived by which the labour of churning might be lightened; but we are not aware that they have been attended with much success. The American, and the table churns, available for the immediate manufacture of butter every morning for the breakfast of the rich, are so far a step in advance, and a luxury; but for the large operation of the dairy farmer, a better application than the churn of his forefathers, we believe, has yet to be discovered.

The true method of butter-making, is to have the churn, and the temperature of the dairy, arranged so as to preserve, as nearly as possible, the degree of heat necessary to the perfect separation of the cream. It should not be so high as to impart a too great degree of sourness to the contents; but, if it be too cold, the butter will not separate effectually; whilst the operation of churning will be extremely tedious, render the butter full of breaks, make it brittle in texture, and give it a pale colour. These will be the results of a too cold temperature; whilst a too hot temperature will make it both light and oily. Another essential point towards the production of good butter is, that the cows, from whose milk it is to be made, should not have calved

too long. Should this have been the case, the butter will have a bitter taste, and be destitute of that agreeable flavour which ought to form an important element in every kind of dairy produce. The best butter is supposed, by some, to be made from one-half of soured cream, and the remainder from fresh. The reason assigned for this is, that there is a sufficiency of the lactic acid in this portion to facilitate the operation of churning; whilst, in the remainder, there will be enough of the caseous matter to prevent insipidity in the butyraceous mass. Let it always be remembered, that if a rancid or disagreeable taste be imparted to butter, it is no longer fit for the table; it cannot be used for the purposes for which it is essentially made; although it may be so far restored, or improved from its disagreeable state, as to become suitable for pastry purposes. As the unpleasant acids with which it may be suffused are all, to a certain extent, soluble in water, the butter should be immersed in clear, fresh spring water, then placed over a slow fire, and kept there until the liquid boils. It should then be skimmed, and the butter put into fresh cold water, again to undergo the boiling process. After this it should be thoroughly washed, when it will be freed from many of its impurities, and may be very well adapted for pastry, although it will be too insipid for the table. When butter has to be preserved, or packed for transportation, the author of *The Cow* directs that it should be salted. "If it is to be moved far, it may be necessary to pack it well, and exclude the air. Hence, when it is made on a large scale, it is put in firkins, or casks, holding from three to five stones, which are carefully fastened up by the cooper, so as to exclude the air. Salt is well known to have the power of preventing animal matter from falling into the putrefactive state, by means of its peculiar antiseptic power, which prevents the caseous matter of the butter from becoming putrid, and running into decay. But such is the affinity of salt for the moisture of the atmosphere, that the outer portions of the butter soon become subject to the changes which contact with the atmosphere produces. In order, therefore, to keep it for any length of time, it must either be covered with a saturated solution of salt, or with a syrup of sugar, which has the same effect. Otherwise it must be placed in casks which are air-tight, or nearly so, with the top and bottom dressed with salt. In fact, the more the moisture is protected from the atmosphere, the more closely will the wood of the cask adhere, and *vice versâ*. A very important means of preservation is thus afforded to the dairyman, and to the inhabitants of our large towns; for without this, even with all our facilities of railway transit, it is difficult to conceive how a constant supply could be maintained. The firkins made in summer are opened in winter; and, though not so rich in their contents as the fresh products from the dairy, they form a second-rate class of butter by no means disagreeable, called kennel butter. When these are opened for use, a very free washing should be given them, to wash out the soluble lactic acid; and the butter should afterwards be well washed, and kneaded in new milk. This gives it much freshness and flavour, which improves and renders it, if well made and packed, much more pleasant than some of the turnip-flavoured fresh butter made in winter."

In France, Bretagne butter has obtained great celebrity, for which it is almost entirely indebted to the mode of its manufacture. The immense sale which it has, necessitates it to be made in large quantities, and this circumstance greatly improves its qualities. The manner in which it is produced for the market is by no means complicated. After being churned and washed, it is steeped, or sprinkled abundantly with new milk. It is then kneaded into cakes of a cylindrical form, and placed, for a few minutes, in a kind of cylindrical frying-pan, with heated coke both below and above. After this, it is taken out in a condition ready for immediate use. Although the flavour of this butter is peculiar, it is especially rich.

Butter does not seem to have met with the same favour among the ancients that it has generally among the moderns. It was late before the Greeks appear to have had any notion of butter; their poets make no mention of it, and yet are frequently speaking of milk and cheese. The Romans used butter no otherwise than as a medicine, never as a food. The ancient Christians of Egypt burnt butter in their lamps instead of oil; and in the

Roman churches it was anciently allowed, during Christmas time, to burn butter instead of oil, on account of the great consumption of it other ways.

The principles of *Cheese-making*, in many respects, are those applied to the manufacture of butter; but the objects being, to a certain extent, different, they are applied in a way quite distinctive from the other. They all, however, centre in the artificial development of the caseine of the milk, whether that be new or skimmed. If left to itself, the lactic acid (into which the sugar of milk is changed), it has been observed, soon begins to form, when the air and temperature have arrived at that condition which is favourable to its development. If to this mixture heat be applied, to such an extent as to cause the caseous matter to expand, genuine curd, fit for the manufacture of cheese, would be the result; but the cheese would be unpalatable, hard, and brittle, and the process too slow for the purposes of commerce. Hence it is necessary to introduce some kind of substance to facilitate the change. Lactic acid, added naturally or artificially, combines with the soda which holds the caseine in solution, and will form lactate of soda. Here the acid will, with the addition of a little heat, be developed; and, in order to accomplish this, various means have been adopted. The usual addition which is made for the effecting of this object, is that of the stomach of the calf, or some ruminating animal. In its natural state, the stomach of the calf causes the milk to curdle, and frequently this curdled milk forms the contents of the calf's stomach. The animal having first had a full meal of milk given to it, is withdrawn, and made use of to turn the milk into that state which is necessary for the ultimate production of cheese. This, however, is not necessary, for the stomach itself will effect the desired change. Let this be well washed and chopped up into pieces. Let these steep in water, say for ten or twelve months, until it is reduced either to a liquid or a powder, and this will *turn* the milk. Even the skin itself will cause the milk to coagulate. An idea prevailed, and to some extent, no doubt, does still prevail, that it is the gastric juice of the stomach which produces the change in the milk; but although that liquid would produce it, it has now been satisfactorily proved that the change is effected by some acid in the structure of the rennet itself, especially in such a case as that to which we have referred —namely, when the stomach is used after having been steeped for twelve months in water. The coagulating process, however, may be effected by other means than by the rennet. Vinegar, tartaric acid, alum, and even milk itself, have all been used with success, under circumstances favourable to the operation. In reference to new-milk-cheese, the whole of the milk, immediately it has been obtained from the cow, and passed through a sieve, is subjected to the action of the rennet. "In cases," says the author of *The Cow*, "when a full meal of milk will not produce a cheese, the milk of the evening is reserved till the morning, both added together, and the rennet poured upon the mass. As something like 95° is the heat at which coagulation and contraction of the curd is performed with the greatest rapidity, the milk should be raised to about that degree. If more heat than that is given, the cheese will be tough and waxy; if less, there is some difficulty, owing to its softness, in separating the cheesy from the watery matter. In cold weather, a small quantity of hot water has to be added to the new milk with the rennet; but if much water is added, or the temperature interfered with more than necessary, it injures the quality of the cheese." When this part has been satisfactorily effected, the cutting-up of the curd is the next step to be taken in the manufacturing of cheese. This is to separate it from the whey—an operation in which a considerable degree of care is required to be properly done. If effected rapidly, or in a slovenly manner, the mass will burst, and the butyraceous particles be pressed out. This duty must not be postponed after the curd is formed, or the whey will have more butter than ought properly to belong to it. To drain away the whey held loose in attraction by the curd, this must be cut in pieces, and laid in a strainer; then, by light and equable pressure, the remaining portion of the whey must be taken off. In effecting this, the pressure, at first, should be slight, but afterwards it may be increased, as the curd, with the evacuation of the whey, gains greater power to retain the fatty matter.

At the commencement of the process, between forty and fifty pounds is as great a weight as it may be judicious to give the mass. Nearly the whole secret of cheese-making, says Mr. Milburn, "depends upon thoroughly draining off the whey. This carries off the sugary matter of the milk, the lactic acid, and, perhaps, also the rennet. These substances are so liable to undergo changes, that cheese-making altogether depends upon this process being properly attended to. In some places even the curd is washed; for little injury, beyond the danger of washing out some of the butyraceous matter, would be sustained, compared to the loss incurred, if the cheese were suffered to retain any considerable portion of the whey. Besides, as butter is sometimes churned from this whey, the loss is made up to the dairyman, if not to the consumer, in another way. So powerful is the tendency of the albuminous matter of the caseine to putrefy, that even cheese itself will not keep unless the salting process, in one shape or another, is adopted. This is performed in the manner most favourable to the production of the peculiar kind of cheese for which a district may be famous, and is either added to the curd, or *rubbed in* after the cheese is made and strained. Such is the affinity of salt for moisture, that it will soon permeate the whole mass of the cheese, and preserve the caseine from putrefaction by its peculiar antiseptic qualities."

In making cheese, the most scrupulous cleanliness should be observed, as the flavour of that article is often much more easily injured even than that of butter. The *inoculation of cheese* is one of the refinements of modern taste and luxury. A blue mould is, by some, considered the *sine qua non* of a tasty cheese; while others prefer the decay to be grey, and the cheese to be in a state of putrefaction, so absolute as to be soft and wet —a nidus for mites and the jumpers. If it be desired to give to a cheese, especially a Stilton, the flavour peculiar to one of its kind, it may easily be accomplished. A dozen holes may be made in the specimen to be operated upon, with the common cheese-trier, and the pieces taken away. The same trier may cut as many pieces out of the favourite cheese, and insert them in the places from which the others were removed. This, covered up in a close place for a month, will, if free from mould before, turn out absolutely ripe, and be of the same flavour as the cheese from which it was inoculated.

THE ART OF MILKING.

The art of milking well is not taught in a hurry. It requires long practice to milk properly; and therefore all the young people on a farm ought to be shown how the labour should be done. It is quite important that this branch of the dairy should be particularly attended to, for a good milker obtains at least a quart more from the same cow than a poor milker. The first lesson to be taught to young people is gentleness and kindness to the cows. These never need be treated harshly, if the business is properly commenced. Cows that have been caressed, and uniformly well treated, are fond of having the milk drawn from the udder at the regular time of milking, for it gives them relief from the distension of the milk ducts. Let young people be put to milking the farrow cows first, or such as are to be soon dried, and then the loss from bad milking will be less injurious; the hands should extend to the extremity of the teats, for the milk is then drawn easier. They should be taught to milk as fast as possible. More milk is always obtained by a rapid milker than by a slow one. They should therefore be taught to think of nothing else while milking, and no conversation must be permitted in the milk-yard. They should sit up close to the cow, and rest the left arm gently against her shank. Then, if she raises her foot on account of pain occasioned by soreness of the teats, the nearer the milker sits to her, and the harder he presses his left arm against her leg, the less risk will he run of being injured. Cows may be taught to give down their milk at once; and they may be taught to hold it a long while, and to be stripped indefinitely. The best way is to milk quick, and not use the cow to a long stripping, or an after-stripping.

"The most important part, in the operation of milking," remarks the author of *The Cow*, "is perhaps to *milk clean*—to take out the whole of the milk from the udder. Not only is the last portion the richest in cream and in butter, but there is not a more certain way of drying a cow than allowing a part of her milk

to remain in the udder. It is a good plan, but too generally neglected, to wash the udder with warm water before milking. Nor is it of less consequence to have a good-tempered and expert milker. A savage, ill-tempered milker will often spoil a cow; and, if she once holds up her milk, it is a proof that the milker is defective or disagreeable to the animal, either from her disposition and temper, or in the manipulation of the udder. Pleasant milking is that which sensibly relieves the cow's udder. A free, decided, but gentle grasp of the teats, and a full and vigorous stream of milk, are the marks of a successful milker. It is desirable to rub and stroke the udder when the stream ceases, to encourage the delivery of the slightest remains; nor is it a bad plan for the milker, or, in large dairies, for the foreman, or even master, to take a small measure, and follow the milker to 'strip' all the cows. There are some masters who make a point of always attending to this at the milking, and they thus see the character and capabilities of the milker. Women are by far the most capable of milking; their hands are more gentle and delicate, and the cows seem generally to prefer them."

As a sort of climax to these remarks, we would suggest a few rules, which might be advantageously acted upon. If you would have a gentle cow, be gentle yourself. If a cow kicks much, have a switch under the left arm, the pail in the left hand; and if, while milking, she kicks, let this act be invariably followed by a single blow. Never strike but once at a time, even if she kicks so hard as to break your leg, and never omit it if she hits only the air. By never striking but once she has no time to "get mad," when she is all the more terrific; for who cares for a blow while stimulated by fury? A small mess of pleasant food, at the time, will serve to do away with any disagreeable impression in connection with milking. To be a good milker, you must pare your nails short; sit on a stool; milk fast; never scold a cow; never get out of patience; tie her tail to her leg in fly time, *and never wet the teats with the first stream of milk.* Milk, applied to the teats to soften them, dries and forms a glossy varnish, which tends to cause cracking or chapping of these parts. Cold, or a little warm water is much better, becoming quite dry by the time the milking is finished.

Milking should always be performed the very first thing in the morning; never later than five o'clock in summer, and six in winter. In the evening it may be done at five; and regularity, in this respect, should punctually be observed. If distant, cows should not be driven home, but the milk should be carried from the field; for a great waste of milk will take place, if they are driven about. If under cover, their feed should be given them whilst being milked. It assists to quiet them, and makes them part with the liquid the more freely; and as most milk-cows, in winter and spring at least, have mash, it is desirable to give them this during the milking, the first thing in the morning.

Several attempts have been made to accomplish the milking by other means than the hand. Syphons have been invented, which were alleged to have the peculiarity of emptying the udder without the use of the hand. But they have not been found so successful as to obtain any extensive encouragement. Indeed, we question if they have ever been heard of by many large agriculturists. The syphon was constructed on an erroneous principle, by distending the mouth of the inner duct of the milk in the teats. This subjects the cow to a flaccid state of teat, and is very likely to cause her to commit the fault of milking herself.

There is a plan, in use in the United States, which proceeds on the principles of compression and suction, and which are the only modes of overcoming the tension of the udder. The American instrument consists of four india-rubber bags, which are drawn over the teats, and set so as to be air-tight. "At the lower end of these, metallic tubes, with taps, are inserted. When the adjustment is perfect the taps are turned, and the whole of the milk in the udder is said to be thoroughly exhausted, and in half the time required for hand-milking. It is said that a man can milk ten cows thoroughly in fifteen minutes."

A novel, and somewhat extraordinary experiment on milk-cows, was not long ago made by M. Delamarre, at Paris. After the fifth or sixth gestation, and five or six weeks after calving, the cow underwent an operation, by which she was deprived of her ovaries, in order to render her unfit for subsequent reproduction. This operation, though known to

the ancients, in modern times has only been practised partially for some years. It can now be performed without external incision, and with little danger. By this means the nature of the animal is changed, and the successions of rut, gestation, and parturition disappear. In this new state, the milk becomes regular, and is yielded in full abundance for a whole year, and in smaller quantity, but improved quality, for two, or even three years, provided the animal is not too old. When the lactation ceases, this animal, which, during a calm and tranquil life, has gained the development and fatness necessary for the market, can be delivered to the butcher in perfect condition, its flesh much superior to that of ordinary cattle. Thus, not only is better milk given, but better beef is produced. This milk is more abundant in cream than usual, and it is equally rich in "caseum," which forms the nourishing principle in milk. The butter extracted from it is exquisite in taste, testifying the abundance and richness of the caseine. This milk is found, moreover, excellent for nourishing infants, who instinctively prefer it to any other.

PRESERVATION OF MILK.

For this purpose, various plans have been adopted, notwithstanding that the ingredients of which milk is composed are so various and changeable in their nature, that it is more difficult than might at first be supposed, to preserve it with success. The Dutch mix their milk with carbonate of magnesia, which thickens it, and prevents it from souring. This, or some other alkaline mixture, has the effect of preserving it for a short time, especially in winter, by forming a salt with the lactic acid, and by keeping the caseine in a state of solution. Carbonate of soda will produce a similar action; and it is believed by some to improve the tendency of the cream to separate from the milk. Another plan is to bottle the new milk, and immerse them in a pan of cold water, placing this on the fire until the water boils. The air in the bottles thus becomes rarefied; and, if corked up hot, the milk can be kept for a considerable time in a state of comparative freshness, to be used immediately the bottles are opened. The addition of a few grains of carbonate of soda will greatly improve its keeping qualities. It should also, after this, be kept as cool as possible. M. Adepert's method is to subject the milk to a heat so gentle, that the great bulk of the purely watery parts will be evaporated; then to be closely corked up. This has a far greater tendency to resist decomposition than if the whole of the watery particles were still retained as an element in the beverage. If, while hot, it were boiled in the bottles in which it was to be finally corked up, as in the instance above, with a small addition of soda, it might keep in a palatable condition for a considerable period—not indeed to compete with newly-produced milk, but to be a luxury on board a ship far out at sea, without any fresh supply of that nutritious article. Duchoff, a Russian chemist, goes beyond Adepert, and professes to furnish a supply of milk for any length of time, to be used at pleasure. It is by forming essentially a milk powder. He proposes to evaporate from the milk, by a slow fire, the whole of the watery matter, and thus have a solid and pulverulent mass, which may be kept in a small compass in a bottle, and, when required, be dissolved in a proper quantity of water; and, as milk contains water in the ratio of nearly nine-tenths of its substance, it may, possibly, be much reduced in compass, and made capable of being produced extemporaneously at pleasure. This would supply a great desideratum.

THE DAIRY.

The dairy should be kept apart from the house, from open grates and from dung-heaps, and should, as far as possible, be so regulated as to preserve an equable temperature.

What its construction ought to be is thus described:—"As, however, it is much easier to keep a cold building warm, than to cool a hot one, it is desirable that it should be, as much as possible, shielded from the sun's rays. It should have its side to the north, its end to the east, and, if possible, be let into the earth a few feet, but not so deep as to interfere with the drainage. If covered by a large tree, it would be all the better. Around it should be either a hollow wall, or peat earth should be walled round its exterior; or, as another alternative, and possibly the best, but most expensive, it should be surrounded by a

verandah. It should also have a double roof, and abundant top and side ventilation—either of which should admit of being closed. It is necessary to have in it a pump, and the floor sloping. On the highest part, a perforated pipe should be connected with the pump, to allow of the cleansing of the floor, when necessary, with cold spring water. The bowls should either be earthenware or glass dishes, placed upon wooden tables—fir, maple, or sycamore being the best—or leaden bowls may be used, placed on frames, and surrounding the dairy. Slates are the best for the floors; and a lining for the walls, of white pottery, is not only elegant, but useful. A pipe, connected with the boiler attached to the kitchen fire, with a stop-cock, so as to regulate the heat of the room in winter, is a great advantage. The scalding and churning-rooms should be distinct from the milk-house, and the latter should be kept as free as possible from all kinds of foreign matter."

CHAPTER VI.

DISEASES OF CATTLE, AND THEIR REMEDIES.

THERE is no part of our subject capable of giving less satisfaction than that which treats of the diseases of cattle, inasmuch as it is very difficult to know what is the precise nature of the complaint with which any dumb animal may be afflicted, and therefore it is surrounded with a darkness which cannot be dissipated without both an enlarged and an enlightened experience. The extremes of temperature, or the sudden transitions from heat to cold, are frequently the causes of disease in young cattle. It is, in many parts, a common practice to tie up animals, of different ages, in the winter, with the view of depasturing them in the following spring. Generally speaking, cattle buildings are quite inadequate for such a purpose. They are frequently in a wretched condition; there is seldom drainage for the liquid matters below, or free ventilation for the exit of foul aërial matters above. Such a condition of things may do for fattening beasts, because in such a warm, close atmosphere, the respiration is but little exercised, and, the blood being but imperfectly decarbonised, fat will more readily accumulate. Under such conditions the vital processes naturally become weakened, without, perhaps, disturbing any particular organ; and, on the cattle being turned from their warm quarters in the spring into the open fields—oftentimes, too, with very little hair on their backs—for, from the hot-house system of management which they have undergone, they are prematurely preparing to put on their summer coats—disease is induced in various ways. The sudden transition from heat to cold produces internal congestion, of the liver in particular, which has been stimulated throughout the winter with highly carbonised blood; and, hence, diarrhœa and dysentery are a common occurrence. Catarrh is also produced from the same influence, and sometimes bronchitis, which is a highly dangerous disease, and requires prompt attention, and all the aid that veterinary skill can afford. When the disease reaches the bronchi, the cough has a frequently painful husky sound, and is easily recognised by the anxious, haggard look, and rapid laborious breathing which the poor animal exhibits. In favourable contrast to this mode of wintering store-cattle, is that of keeping them in small yards, having comfortable roomy sheds attached, where they are sorted, according to age, and supplied with a fair allowance of roots, hay, cake, or corn.—In cases of consumption and chronic diarrhœa, there is generally an hereditary taint; and breeders should beware of breeding from stock having such predispositions. It is also a very reprehensible practice to rear calves on skimmed milk, or to supply

them with insufficient or unwholesome food. Many diseases spring from this. By depriving the milk of its cream, the greater portion of the muscle and fat-forming principles is removed, whilst the phosphates are rather in excess; and hence the origin of such a number of sharp-backed, flat-ribbed, coarse beasts, which devour more food than stock of a better description, and, when fattened, present nothing but coarse beef, having scarcely a joint fit for the shop of a respectable butcher. Breeders of calves would find it advantageous to accustom them to consume small quantities of linseed cake when about six weeks old, and this increased in proportion as the milk is withdrawn. When the weaning takes place, the allowance of cake should be still further increased, which will prevent the *check* so commonly produced in their growth at this period, as shown by their large bellies, and dry and thrifty appearance. The cake should be continued until the calves are so accustomed to the grass as to be able to dispense with it. It may be imagined that this system of feeding may increase the liability to inflammatory fever, or felon, to which stock at this age, as well as yearlings, are exceedingly disposed; but, to prevent this, farmers should increase the strength and constitutions of their young stock—a condition not obtained by excess of food at any one time, but by regular feeding and proper management.

An imperfect system of drainage of soil is another fruitful source of disease in calves and yearlings. During periods of moist, warm weather, on undrained soils, a disease called "hoose" frequently prevails. The windpipe and bronchi become filled with masses of worms (*Strongylus fibaria*) and mucus, occasioning violent inflammation of the membranes of the air-passages. As these remarks apply only to the more prominent of diseases in cattle, we may observe that inattention to first symptoms often terminates in fatal affections. The majority of such cases which occur on a farm, proceed from not attending to the premonitory signs of disease. These, in cattle, are usually recognised by the animal showing a loathing for food; suspended rumination, or lazily performed; the muzzle dry, instead of being bedewed; respiration increased; hair pitched, and not licked. When these symptoms, or any of them, make their appearance, it may be taken as a certain sign that disease is approaching; and it becomes a duty to act without delay, as, by doing so, the disease may be mitigated or arrested. Very little attention to the causes of disease must show that they are commonly the result of mismanagement, rather than of accident or of circumstances which cannot be controlled; even the agencies inducing epizootic and contagious diseases may be guarded against, or considerably modified, by proper and regular feeding, good drainage, and suitable yards, sheds, and farm-buildings. The great secret of keeping all animals, however, is to tend them carefully and keep them well. Let the land, which is thought to be subject to disease, be thoroughly drained as well as farmed; let the bad herbage and cold beds of the cattle be improved, and they will be healthier, and thrive better. It is safer always to pay the cake-crusher or the miller, than to pay the veterinary surgeon, however skilful he may be.

Blown, Hoven, or Over-Full.—Sometimes a change of food, or a feed of wet clover, or potatoes greedily eaten, will induce fermentation in the stomach, instead of digestion. The sides will be blown up, until the stomach presses on the skin with a force which renders it hard to the fingers.—In treating for this disease, by far the best method is to use the probang. It should be introduced to the stomach by the throat, and then the foul air will generally immediately escape. When this instrument is not at hand, the beast may lie down, and the disease may continue till the walls of the stomach are ruptured. In these cases an ounce of ammonia will often give relief. A pint of vinegar has been known to effect it; but the safest remedy is a *pint of linseed oil.* Use gentle exercise; but all kinds of violence, and, above all, such doses as tar and salt, given with the idea of making them eject their saliva, can only do harm.—When it is necessary to cut into the stomach, employ a veterinary surgeon.

Calving.—Strictly speaking, this cannot be called a disease; but it ought not to be entirely overlooked in a work of this kind; for, in some cases, more especially in the first or second instances of parturition, there is great danger of the birth not being effected without

mechanical assistance. After this, however, the danger is not so probable, provided the proper presentation takes place. It has been said, that such animals as bring forth their young without any attention whatever, do the best; and we have no doubt that much could be said in favour of this observation; but whether it be true or not, there is no question that premature interference is more likely to be attended with unsatisfactory results, than if the animal were left entirely in the hands of nature. The first decided symptoms of coming labour, exhibit themselves in what is called "the waters;" after which the cow will apparently feel perfectly at ease for an hour or so, and sometimes eat a little food. The second being thicker and larger, envelops the feet of the calf. When both symptoms appear, a little mechanical assistance may, with safety, be given, should the head be found above and between them. Above all things, time should be given for nature to work out her own operation, and the calf will appear in due time. In cases of false presentation—such as the appearance of the head, a single foot, or the hind legs—it is, at all times, the best plan to call in the aid of a veterinary practitioner. "Some persons," says the author of *The Cow*, "have the practice of giving every cow a calving drink. We uniformly prefer, as we said, nature's medicine—the licking of the calf—to any and all others which can be given. If it has been a long and protracted labour, a drink of a quart of home-brewed ale, or a pound of treacle, will be found useful. If the cow refuses to lick the calf—which heifers of their first calves will sometimes do—it is seldom necessary to do more than run the hand over the newly-dropped calf, and then pass it across the mouth and lips of the mother.

Abortion.—This is frequent in some individual cows, and is often caused by the disagreeable effluvia arising from the decaying matter which is suffered to pollute both the cow-houses and the yards. Imagination has also a great deal to do with this. Indeed, to such an extent is this the case, that an instance of abortion in one cow, has caused an epidemic of the same kind to affect all the rest in the yard. The cow that has successfully calved, should, therefore, be immediately removed from the others, and placed in a situation of quietness and solitude. Chloride of lime ought to be abundantly strewn near and about the stall where she was; and the noses of the whole of the others should be rubbed over with tar. *Retention of the placenta*, or failing to cleanse, sometimes occurs, and is indicative of weakness, and a want of tone in the uterus. Where this is the case, a mild stimulant may be given; and nothing is better than an infusion of camomile flowers—say two handfuls in a quart of water—added to a quart of good boiled ale; and, if necessary, apply an injection of soapsuds, to keep open the bowels, and prevent inflammatory action. Should these fail, call in the veterinary practitioner.

Choking.—Where this has taken place, from the effects of some large root having "stuck in the throat," an effort must immediately be made to relieve the animal. The mouth should therefore be first examined, in order to discover whether the object cannot be extracted with the hand, which is by far the best instrument to use, if it can conveniently be done. Should this not be the case, however, the assistance of the probang, invented by Dr. Munro, must be called in. Before using this instrument, a little sweet oil should be first given; after which it should be carefully passed into the mouth, with the cup end downwards, and gradually moved towards the impediment which has caused the choking. Should this be a turnip, which is not unfrequently the case, and should it offer much resistance, the instrument must be withdrawn, and its position changed. Generally, however, this will not be necessary, as the root will pass down without much effort. Sometimes it may even be got out, by pressing the thumbs up each side of the neck, accompanied with a pressure of the hand.

Costiveness.—In calves this disease is sometimes found; and unless it has assumed a very severe form, it is not necessary to have recourse to medicine. An ounce of fat bacon, boiled with a handful of onions, will, in all probability, act as a suitable relief; whilst its nourishing properties cannot injure, but may improve the health of the animal.

DISEASES IN CALVES.

Young calves are not subject to many diseases, and medicine is very seldom necessary

to restore their health, provided they have been well-managed, not neglected and half-starved. Diarrhœa, or the *scour*, is usually the most fatal disease with which they are attacked; and, as this is usually the result of some acrid or foreign matter in the bowels, it is generally mitigated or removed in a short time, by giving them a table-spoonful of sulphur in their milk. Should the attack continue after this, administer a table-spoonful of tincture of rhubarb with a teaspoonful of laudanum. Mr. Milburn tells us that he once had a calf nearly dead of diarrhœa, which was so violent as to defy all the efforts of medicine. It was all but dead, when he gave it a bottle of port wine, expecting its death next day. In the morning, however, it was well, and crying out for its breakfast. Mr. Milburn adds, that a pint of good old port will often work wonders, when all other remedies have failed, both in man and beast.

The Epidemic.—The symptoms of this disease are characterised by their affecting the mouth with blisters, and the feet with inflammation and pain, and is very troublesome.—In treating for it, give, in the first stage, a dose of Epsom, or Glauber salts, accompanied with bran-mashes and shelter. This will generally prevent dangerous results; but, should the foot break out, or an eruption occur, treat as in the case of *foul in the foot*—which *see*.

Felon.—Mr. Karkeek considers the outset of this disease to be a febrile condition, induced from sudden excess of food at a period when the tone of the vital principle is unequal to the work. The capillary arteries are more numerous and active in the early period of life than at any other, while they are carrying on and completing the organisation of the frame. They are, in fact, the masons and architects of the system; but, if a larger supply of building materials is forced into these vessels than can be efficiently used up in reparation and growth, active congestion takes place almost everywhere; the vital principle is suddenly reduced; the body becomes amenable to the ordinary chemical affinities; destruction of the living parts ensues by decomposition, even whilst the animal is alive, shown by the extraction of gas from the cellular membrane, and by the extensive sloughing process in the skin. The great point, then, in the rearing of calves, is to take care that the vital powers are predominant, which condition is only obtained by a proper supply of food, proper temperature, and proper exercise. The complaint, however, is common in all kinds of cattle, especially in the tender breeds, and proceeds from cold and exposure. It is accompanied with low fever and loss of appetite. The coat stares, the eye is heavy, the nose dry, and the back sore. The animal will flinch from the touch, and the teeth will be felt as if they were loose. The remedy, therefore, is in the use of stimulating cordials.

In treating for it, first house and give the animal a drink; then administer 1 oz. of turmeric, 1 oz. fenugreek, 1 oz. liquorice, 1 oz. aniseed powder, in a quart of ale. This will generally prove effective; but, if not, repeat the dose. A very common and very safe process is to separate the nerve of the under side of the tail, which relieves the back, and fastens the teeth. To perform this operation, feel for a soft place on the under side of the tail. The knobs are the joints; the soft place is the bone. Cut the skin across at the soft part, and it will bleed for eight or ten minutes, when the tail should be tied up with a piece of linen cloth. Great relief will be afforded by this.

Foul in the Foot.—To this disease large heavy milk-cows are specially subject. It is to the cow what foot-rot is to the sheep. There is inflammatory action between the parts of the hoof; it begins to discharge fetid matter; and is a source of pain and irritation, which often dries up the milk, and becomes very difficult to cure.

In treating for it, let the foot be first well cleaned and fomented with warm water, and all loose flesh cut or clipped off. The foot may then be poulticed for one night with linseed-meal, and again fomented and anointed with tar. If it should smell very offensively, a little charcoal, or a few drops of chloride of lime, may be added to the water. Next day the inflammation will be lessened, and its discharge rendered more free by the tar. The foot may then be dressed with butyr of antimony (chloride of antimony) night and morning, and the tar applied afterwards. The foot should be confined in a boot or stocking, and kept free from dirt. A little linseed oil or

salts should be given, in order to keep up a gentle state of activity in the bowels.

Gripes.—Young calves are frequently attacked by this disease after having sour milk given to them. It is attended with acute pain, as may be inferred from their pawing the ground, and kicking the belly with their hind legs.

In treating for it, give—a cupful of peppermint-water, and a teaspoonful of laudanum.

Inflammation.—This disease indicates itself by a coldness in the horns and extremities, and by the animal exhibiting symptoms of enduring both acute and continuous pains. Attempts to cure it should never be made but by such as have a thorough knowledge of nature. It is, therefore, indispensable to call in a veterinary practitioner; and the same should be done in all cases of acute disorders, such as stranguary, staggers, &c.

Jaundice, or the Yellows.—This is one of those forms of felon to which cattle are very liable. It is found more particularly to attack white cattle, and is easily recognised. Its signs are marked by a yellowness of the eyes, and also under the anus; when costiveness takes place, the appetite becomes dull, and rapid debility ensues.

In treating for it, give—1 dr. ginger, ½ oz. Barbadoes aloes, 4 oz. common salt, 1 quart home-brewed ale, made into gruel.

Loss of Cud.—This disease sometimes affects ruminating animals, and is indicated by the incapacity of the stomach to throw back into the mouth the half-masticated food which has been swallowed, to be again chewed.

In treating for it, give—6 dr. Barbadoes aloes, 1 oz. allspice, 3 dr. ginger, 6 oz. common salt, in a quart of gruel.

Milk Fever.—Cows, which are deep milkers, are, especially in summer, very liable to this disease; to prevent which the utmost care should be taken. When it has occurred, it is always best to call in the assistance of the veterinary practitioner, rather than for those who, not having much experien try to deal with it themselves. The recommendations given by the author of *The Cow*, are—to milk the cow, before calving, regularly three times a day, provided the udder be much distended. To keep her as cool and as quiet as possible, and to give her mashes of bran only, for a few days after calving. This is cooling, and somewhat laxative. If the udder should be hard—which it should not be after this treatment—it may be rubbed with marsh-mallow ointment. A gentle dose of purgative medicine can be given if the cow is in very high condition; and she should be driven a few miles every day before calving.

Pleuro-Pneumonia.—There is no specific remedy, with which we are acquainted, for this disease. A gill of spirits of turpentine, and a gill of spirits of sweet nitre, has been successfully tried; but it is a desperate resource; and should the animal be fat, it is wiser to dispose of it at once, before the flesh gets tainted with the disease, and partially corrupt.

Quarter Felon.—This is one of the most stubborn of all the diseases to which cattle are subject. It is called Inflammatory Fever, or Quarter Ill; and, although there are instances of its having been cured, they are rare, except in cases where the disease has been early arrested in its progress. It makes its appearance usually before the calves are a year old—seldom after; and, from its being extremely contagious, it has been known to pass through an entire herd before they had reached that period of life. Its first evidences make themselves known by the calf beginning to loathe its food, and becoming stiff or lame in one of its feet; and, although the foot may be examined, and no cause of lamene visible, yet the disease will very soon become general. Air-bubbles form between the skin and muscles; and there is a crackling sensation to the hand, on passing it over the skin, especially in the legs. Inflammatory fever is disorganising the body. Either for prevention, or as a remedy, no specific for it has yet been discovered. The following has been recommended.

Preventives—as the seton in the dewlap, bleeding in autumn, doses of dyers' madder, &c., are favourite remedies. The seton can do no harm, but it may be tried.

Red Water.—In some kinds of pasture, cows are, in summer, frequently attacked with this disease. In treating for it, give—a dose of 8 oz. of Epsom salts, dissolved in a pint of water. This, if taken in an early stage, will almost invariably set the beast right. If not at hand, 1 lb. of common salt may be given, and the dose repeated in case of need.

THE CATTLE PLAGUE.

In the July of 1865, the population of London were generally startled by the appearance of a disease which was decimating the cattle of the country, and of which tens of thousands of them had never either heard or dreamt of. In the previous month a note of warning had been given, that some certain calamity was about to deprive them, to a large extent, of "the roast beef of England;" but as the aggregate nervous system of this great and active city is not easily disturbed by things at a distance, its inhabitants still continued to eat their beef, without troubling themselves, in any visible way, about what was to befall them by being deprived of it. In a short time, however, they heard that a species of murrain, or plague, had been imported, it was supposed, from Russia, and soon assumed the most alarming characteristics. This disease was subsequently called the rhinderpest; but it soon became generally known throughout the country as the "Cattle Plague."

As the origin of all diseases is attributed to predisposing or exciting causes, a majority of evils require several agencies acting in combination to produce them. There are some, however, which can only be developed by one invariable and specific means; and this has received the name of contagion. For example, a sheep can only become scabby by the influence of the scab-insect crawling, and multiplying, over its body; as a dog can only become mad by the virus or rabid poison of some other mad animal, inflicting a wound on, or by some other means, entering its body. From a knowledge of these well-established facts, men of science have come to the conclusion that cattle can only be attacked with the rhinderpest "as the result of direct, or indirect, communication of the rhinderpest poison to a healthy from an unhealthy animal." General anxiety, from the dreadful strides with which this malady advanced, gradually rose higher and higher; when the government, also, excited by its manifest progress, issued, in the latter end of September, a commission from the crown, authorising certain persons therein named to investigate the origin and nature of the disease; and to report upon the mode of treatment best adapted for the cure of the infected animals, and the regulations proper for preventing the spread of the plague, or its future recurrence. The commissioners, urged by the evident necessity of the case, lost no time in prosecuting their inquiries; and having taken evidence from the most competent persons, upon whose information they could rely, made their report within about the compass of a month from the date of the commission. This important document contains the best authenticated information relative to the origin, progress, and treatment of the disease; and is replete with the most important facts respecting it.

According to the commissioners, the "plague" was first observed in this country towards the close of the month of June, 1865. About that period a couple of English cows had been purchased (the actual date was June 19th) in the Metropolitan Cattle Market, by a cow-keeper residing in Islington, in whose sheds they were when the symptoms of the disease first attracted (on the 27th) the notice of the veterinary surgeon in charge of the general stock. The same surgeon observed similar symptoms of the disease on the 28th, in a cow which belonged to a dairyman in Hackney; and which had been purchased in the same place, and on the same day. Two Dutch cows, in a Lambeth shed, likewise purchased in the Metropolitan Market on the 19th, were attacked on the 24th, and immediately afterwards the plague spread through many of the London dairies. As an appalling evidence of the remarkable virulence of the distemper, we may observe, that the Islington cowkeeper lost her whole herd, amounting to ninety-three; she also bought more—lost them also; making 107 in all. An inspector, who had charge of a great part of the north-east of the metropolis, stated that, in his own district, more than four-fifths had either died or been slaughtered; and the general average, within the precincts of the metropolis, was, in all probability, at least as high. Very early in July it appeared in Norfolk, and likewise in Suffolk and Shropshire; then in one county after another; when it was found, that the rapidity with which it had diffused its desolating breath over the country, had enabled it to enter Scotland. By the 14th of October it had extended to

twenty-nine English counties; two in Wales, and sixteen in Scotland; and was still advancing. From the Metropolitan Market it crossed the sea into Holland, with some Dutch oxen which had been shipped from Rotterdam to London, and had been exposed during three successive market-days, when, not being sold, they had been re-shipped from London to whence they came. It is unnecessary here to follow its further progress; but we may state that, at the Smithfield Club dinner, at which Earl Spencer presided, Mr. Clayden, chairman of the "Agricultural Company," &c., after speaking of the advantages which had resulted to the farmers of England generally by the operations of the club, said that the noble president had drawn a melancholy picture of the state of the agricultural interest from the effects of the cattle plague. He observed, that "30,000 animals had perished from the effects of that incurable disease; whilst whatever efforts had been made to discover an effectual remedial agent, had, in so far as the best-informed and most scientific agriculturists in the world yet knew, signally failed."

It is reasonably to be expected that such an alarming condition of things would originate, among the veterinary faculty, many theories for its prevention, as well as its cure; but the hopelessness of all these, as well as of every kind of medical treatment, was thus set forth in a letter to one of the newspapers, by Dr. Watson, a gentleman who ranks amongst the most eminent of his profession in London. He says—"The disease is a very fatal one. Its death-rate is appalling—90 in 100, they say; and *it is absolutely incurable.* With or without what is called treatment, a small number of recoveries happen; but there are no *cures.* Probably (but this is mere opinion), of the sick animals subjected to treatment, a larger proportion perish than those which are left to themselves. I do not mean that medical care is useless or inexpedient. There are measures relating to food, temperature, cleanliness, support, even medicine (measures that are defensive against all weakening influences), which, sometimes, may turn the hesitating scale, and give the victory to the restorative force of nature. But there is no specific plan or antidote that can stop or chase away the disease, any more than there is for the cure or the cutting short of small-pox; this is alike true of all the specific fevers. They run a definite course."

The conclusion to which this gentleman came was thus given, and largely adopted—"If all this be so, surely it is time to turn our thoughts from the sick and the dying to the animals that are yet left among us alive, in health, and uninfected; to abandon the vain search after impossible specific remedies, and to adopt the true and sole nostrum—which is, *prevention.* This is still within the scope of our power, and it is daily becoming more diffused."

To give entire force to the meaning of the word *prevention* in this passage, it may be added that it is designed to express complete *isolation;* the entire and perfect separation of the healthy from the unhealthy animal; the diseased from the undiseased; the clean from the unclean. This was conceived to be the most effectual, as it has proved the only *real,* remedy for staying and finally eradicating an evil so desolating to our herds. The consequence has, for some time, been an entire riddance of the "Cattle Plague," which is always spoken of as a thing of the past, there not having been, for a considerable time, a single known instance of its existence in this kingdom. The alarm which it created, however, necessitated the most decisive measures to be adopted for its extinguishment.

The death of 30,000 animals, within the comparatively limited period of two years, was a cause sufficient to raise anxiety amongst even a larger population than that of Great Britain and Ireland; yet, in the latter country, the flocks continued to increase rather than diminish or remain stationary. This, however, did not lessen the dread of the extension of the "Cattle Plague" in England, nor hinder the adoption of those strong measures of isolation or prevention to which we have alluded, and which, in the absence of all *certain* medicinal remedies, proved effectual in eradicating it from the country. Superadded to prevention, constant attention should be paid to cleanliness, and keeping the sheds well aired; whilst lime-washing should not be spared. Where cure is doubtful, prevention should be vigorously resorted to.

DIVISION V.

SHEEP.

CHAPTER I.

FOREIGN BREEDS OF SHEEP; THE RASS; THE SIBERIAN ARGALI; THE KAMTSCHATKAN ARGALI; THE ARMENIAN ARGALI; THE NAHOOR, OR SHA; THE SHA; THE CORSICAN MOUFLON; THE WALLACHIAN SHEEP; AFRICAN SHEEP; THE TARTARIAN SHEEP; THE PERSIAN SHEEP; ICELAND AND FAROE ISLAND SHEEP; THE ALPACA AND LAMA; THE SPANISH MERINO SHEEP; THE SAXON MERINO.

FOREIGN BREEDS OF SHEEP.

Of all our domestic animals, the sheep is that of which we have the earliest notice; as we are told that "Abel was a keeper of sheep." It was reclaimed in the primordial era of man's existence on the globe, and we must look to Western Asia as its original habitat. From this centre it has, more or less, gradually spread by the agency of man; and, under the influences of climate, food, and treatment, has ramified into numerous varieties.

In the *Zoological Proceedings*, there is a paper by Mr. Blyth, entitled "An amended list of the genus Ovis;" in which he tells us, that in the narrative of the celebrated Venetian traveller, Marco Polo, upon the elevated plain of Pamir, eastward of Bokhara, and 16,000 feet above the sea-level, wild animals are met with in great numbers, particularly sheep of a large size, having horns three, four, and even six palms in length. More recently, an animal called the Rass has been indicated, from a report in Sir A. Burnes' *Travels in Bokhara*, and its horns have been transmitted to the Royal Asiatic Society. He confirms the narrative of Marco Polo; says the flesh is much prized; and that the people shoot the animal with arrows. "The Rass is said to delight in the coldest districts; a common-sized individual will require two horses to bear its flesh from the field." The horns, following their curvature, are nearly five feet in length.

THE SIBERIAN ARGALI.

This noble sheep is described by Pallas, and has a much wider range of habitat than the Musimon; whilst its general characteristics bear a striking resemblance to those of the sheep. Its natural abode is on the tops of mountains in cold latitudes, and it is common in Siberia.

THE KAMTSCHATKAN ARGALI.

M. Eschscholtz, who describes this species, states it to be very numerous on the mountains of Kamtschatka. In summer it resides upon the snow-clad heights; but, in winter, it descends to the lower regions; and, according to Kotzebue, is remarkable for its agility. In America there are two species very closely allied to the Siberian Argali—the Rocky Mountain Argali *(Ovis Montana)*, and the Californian Argali *(O. Californiana*, Douglas); besides which there is the Caucasian Argali *(Ovis Cylindricornis*, Blyth), hitherto confounded with the Siberian Argali.

THE ARMENIAN ARGALI.

This is the *Ovis Gmelin* of Blyth, of which specimens were sent from Erzeroum to the Zoological Gardens in London. According to Gmelin, this species is found only in the highest mountains in Persia. The males, he informs us, are very quarrelsome amongst each other, insomuch that he had been at one place where the ground was strewn with horns that had been knocked off in their contests. It is allied to the Corsican Mouflon. Sir John McNeill informed Mr. Blyth that it appears to be the common species of the mountains of Armenia; occurring likewise on the north-west of Persia: but the wild sheep of the central parts of Persia is evidently distinct, having horns much more resembling those of the domestic ram, being spiral, and completing more than one spiral circle.

THE NAHOOR, OR SHA.

The Nahoor, or Shà, of Tibet (*Ovis Nahoor*, Hodgson), is a native of the Kâchar region of Nepâl, and the glaciers of the Himalaya. Of this sheep there is very little to be said; but it has a near alliance to the Burrhel—*Ovis Burrhel* of Blyth—which inhabits the loftiest crests of the Himalayan chain. Here it is said to bound "lightly over the encrusted snows, at an altitude where its human pursuers find it difficult to breathe. It has the bleat of the domestic species, as indeed they all have, and is very shy and difficult of approach. Flocks of ten or twenty, conducted by an old male, have been observed to make for the snowy peaks upon alarm, while their leader scrambled up some crag to reconnoitre, and, if shot at, would bound off a few paces, and again stop to gaze. They pasture in deep and hollow grassy glens." A former specimen, in the Museum of the Zoological Society, was shot near the Boorendo Pass, at an altitude of about 17,000 feet.

THE SHA.

This is the *Ovis Vignei* of Blyth, a Mouflon inhabiting the mountains of Little Tibet and the Sulimani range, between India and Khorassan. Vast numbers of this species are driven down by the snow in winter, to the branches of the Indus, where the river breaks through the chain of the Himalayas. The wild sheep of the Hindoo Koosh mountains, described in the *Journal of the Asiatic Society of Bengal*, is either this or a closely allied species. Its climbing powers are extraordinary.

THE CORSICAN MOUFLON.

This is the *Ovis Musimon* of Linnæus, a native of Corsica and Sardinia. Speaking of it, Mr. Blyth remarks—"It has always appeared to me, however, that the specifical distinctness of the Mouflon is very obvious; and I doubt whether it has contributed at all to the origin of any tame race. That it interbreeds freely with the latter, under circumstances of restraint, is well known; but we have no information of hybrids, or Umbri, as they are called, being even raised from wild Mouflons, though the flocks of the latter will occasionally graze in the same pasture with domestic sheep; and all but mingle with them. The male of this animal is denominated, in Corsica, Mufro, and the female, Mufra; from which Buffon, as is well known, formed the word Mouflon. In Sardinia, the male is called Murvoni, and the female Murva; though it is not unusual to hear the peasants style both indiscriminately Mouflon, which (as Mr. Smyth remarks, in his description of that island) is a palpable corruption of the Greek Ophion. It is sometimes stated, but I do not know upon what authority, that a few of these animals are still found upon the mountains of Murcia."

This would seem to be the same as the *Ovis Mouflon* of Buffon, found in the islands of the Grecian Archipelago, in Sardinia, Greece, Asia, and in the western part of European Turkey. It is two-and-a-half feet high, and about three-and-a-half long. It has large semicircular and wrinkled horns, bending gracefully backward, resembling, in some degree, the black-faced sheep of the Highlands. They are, however, much thicker, usually measuring from twelve to sixteen inches at the base, and sometimes as much as twenty-two inches in length. The colour of the animal is grey; and it is covered with *hair*, of a curly and woolly kind. There are a few black hairs about the head. When the female has horns they are very small, but she is frequently entirely destitute of them. They always browse upon the sides of hills, or upon their summits, in very temperate latitudes. They are gregarious, herding together for the purposes of defence; and, like other sociable animals, place themselves under the protection of the largest and the strongest of their rams. When the females are in season, they separate into smaller flocks, and this is the signal for the wars of the males. The females usually *throw* two lambs in the month of April or May, and these the dams defend with indomitable courage in any emergency.

According to Cuvier, these animals are very dull and untameable. He says that "domestication has had no influence" in taming them; "it merely accustoms them to the presence of new objects; and they are no longer affrighted at the sight of man, but rather seem to acquire more confidence in their own powers as they become more familiarised with him. Instead, therefore, of avoiding their keeper, especially

the males, they attack him with fury." There is another peculiarity belonging to this species. Their flesh is well-flavoured; but they are always in lean condition. Their skins are so thick as to be almost impervious.

In this review of Mr. Blyth's paper, we have omitted the Ixalas Probation, Ogilby (of which a unique specimen exists in the museum of the Zoological Society, London, and the history of which is obscure), and the Aoudad (*Ovis Tragelaphus*, auct.), which we refer to the goats. From none of the species here enumerated can we confidently select the type of the domestic sheep (*Ovis Aries*, Linnæus); but, "applying our knowledge as obtained inferentially from the most ancient records," observes the author of *The Cow*, "we find incidental notices tending to fix the character of the earliest sheep, of which history informs us, with the one or the other of the class of animals above referred to, but especially the latter." Abel had "firstlings of his flock." Hence he possessed domesticated animals. The lambs of the Argali would be a ready means of procreating a flock, as they are even now easily domesticated, and which would hardly be the case with the untameable Musmon. Abel also offered fat, which is a secretion common to the Argali, but of which the Musmon is said to be destitute. The sheep of the Patriarchs, too, had horns; at any rate the rams had that distinction. Nor could they be simply upright; as a ram, it will be remembered, was "caught in a thicket by his horns," when the staying angel arrested the hand of Abraham. The curvature of the horns being much more nearly complete in the Argali than the Musmon (which are merely bent back), renders it the most likely of the two to be entangled in a thicket. That sheep were, some of them, brown in Jacob's day is quite certain, from their being set apart for his wages; and this again agrees with the colour of the Argali. That the covering of the skin was something better than hair, even in early days, is quite evident from Laban's shearing his sheep; for it always indicates, at least, a woolly texture rather than a hairy one, which requires the application of the shears. Job, who lived, it is supposed, in early patriarchal times, evidently made use of the wool of his sheep. His flock consisted, at one period, of 7,000 sheep; and, at another, of double that number; and he thus reminds his friends of his benevolence:—"If I have seen any perish for want of clothing, or any poor without covering; if his loins have not blessed me, and if he were not warmed with the fleece of my sheep."

The Mouflons and Argalis—that is, the wild species of the genus *Ovis*—are covered with a harsh kind of hair; having beneath it, at its roots, a short spiral wool, which, in winter, becomes longer and fuller. Mr. Bell, indeed, considers the harsh hair as essentially wool in its structure, presenting the imbrications which the microscope shows to be the characteristic of wool, and on which its felting property depends; and he regards the short under-coat as composed of hair, and not of wool. Mr. Youatt makes the contrary statement; and, notwithstanding the appearances noticed by Mr. Bell, we incline to Mr. Youatt's opinion; for, be it observed, in the Cashmir and the Angora goats, the long outer garment is hair; the short under-coat, exquisitely fine wool. In other wool-bearing animals, as the beaver and otter, the same arrangement prevails; and, in some neglected breeds of common sheep, the wool becomes mixed with long hairs (not short and fine), which more or less obscure the wool.

Dr. John Davy, in the *Philosophical Journal*, furnishes a striking instance of the effect of climate in changing the character of covering on the body of a sheep. He says—"The sheep from Barbadoes, originally from an English stock, affords a striking example of the change that may be effected by climate, in a few generations, in the character of the hair of an animal. In that island, instances are frequently to be seen of sheep in which hair has so taken the place of wool (using the terms in their usual acceptation), that, were it not for the form of the animal—and that is not altogether free from change—it would be impossible to suppose that they belonged to the same species as our English sheep." He carefully examined two specimens of hair—one from a sheep of two years old, the other from one a year old. Both were of the same colour—a light reddish-brown—and the same length. "The hair of the three-year-old," he proceeds to say, "was coarser than that of the one-year-old; it consisted chiefly of harsh fibres, slightly

tortuous, each about the 180th of an inch in diameter—some cylindrical, others more or less flattened—all looking towards a point at their distal extremity. The hair of the one-year-old consisted of coarse and fine fibres in about equal portions, the one about the 363rd of an inch in diameter, the other the 1333rd of an inch; the former resembling the hair of the older sheep, the latter having the appearance of wool, both in its fineness and general aspect, whether seen with the naked eye or under the microscope. The presence of a portion of wool underneath the hair of the younger sheep, accords, I may remark, with the belief of my friend, that all the very young lambs of the island have wool, which gradually passes into hair as they grow older." This, the Doctor thinks, is the fact. He then expatiates on the care "Divine Providence exerts in changing the clothing of an animal to be suitable to the climate it inhabits."

The causes which have rendered the fleece of the European sheep what we now find it, are involved in obscurity. We attribute much, in the first instance, to the effects of temperature; for though the merino sheep of Spain (a race originally imported from England), and the flocks of Australia and Southern Africa, are pre-eminent as wool-bearers, yet it would seem that the predisposition to develop wool at the expense of hair, is acquired only in temperate, elevated, or even cold climates. For instance, we learn from Mr. Hodgson, that the wool of the Bhotean domesticated sheep, called Huniah, is superb; and, he adds, the animal is suited only to the northern district of Nepal, suffering much from the heat of the central district. On the other hand, it is clear that, in the early ages of man's history, the shepherds must have selected, for breeding, those individuals on which the wool predominated; and that, by following up this system, the sheep gradually attained its present condition, so that a wool-bearing breed became, at length, permanently established. Originally, perhaps, the sheep, then a wool-bearer, and long domesticated, was of a brown or rusty-black colour—a hue still lingering on the faces and limbs of many of our breeds, and sometimes appearing as the general tint of individuals, thus conspicuous in the midst of their white-fleeced companions. Nine out of ten of the sheep of Dukhun are black, with short, crisp, coarse wool. As the primitive fleece of the sheep was a mixture of hair and wool, we cannot be surprised to find races domesticated, in which the hair predominates over the wool, and that so greatly, that they may with propriety be termed hairy. Sometimes the hair is like that of a spaniel dog, long and silky; and many of the flocks of the Bucharian Tartars are thus clothed. To this breed may be referred—

THE WALLACHIAN OR CRETAN SHEEP.

This is the *Ovis Aries, var. Strepsiceros*, common in Crete, Wallachia, Hungary, and the western parts of Asia. A splendid ram of this variety, from Mount Parnassus, was presented by Dr. Bowring to the Zoological Society, London. Its was vicious, unruly, and of amazing strength. Its horns were very large, and spirally contorted, adding greatly to its striking and picturesque appearance. Its fleece consisted of hair and wool, the former being of great length, perfectly straight, close-set, and beautifully fine, falling from the middle of the back on each side of the animal, almost to the ground. On the face the hair was short, and of a rusty black; on the body it was white. In general, the horns in the male rise almost perpendicularly from the skull, making a series of spiral turns in their ascent, the first turn being the largest; while, in the female, they diverge, taking a lateral direction. In the specimen, however, to which we have alluded, they extended laterally from the skull, and, after the first turn, took a downward sweep. Variations in these points may be expected in domesticated animals. "The *Wallachian sheep* is a remarkable animal," says Mr. Milburn; "and altogether the most beautiful, as a picture, of all the various breeds. They are common in the whole of Southern Russia. The horns of the ram are of a peculiarly tall and spiral form. The wool is of a hairy character, but beautifully white. The tail, however, is the peculiarity. Kohl, in his *Russia*, says, 'it really carries its fat about in its tail, which grows into a shape something similar to a pear, swelling at both sides to an enormous size, and tapering to a point at the extremity.' The Russian shepherds are a very dull and helpless race of men; and more credit is due to the dogs and goats which accompany the flocks, for

their care of the animals, than to these serfs, who are indolent, and dull of comprehension. About four goats are associated with a flock of every hundred sheep to brave the Pontine hurricanes, and to lead the sheep over ravines, and by the sides of steppes, which otherwise neither the sheep nor their shepherds would face. The sheep *follow* the courageous goats; and, on once making the effort, they have powers quite equal to the task. The shepherds are strictly nomadic. They wander from pasture to pasture, accompanied by their dogs and a waggon, which is their kitchen and bed. The sheep are collected for the night into as narrow a compass as possible. The dogs watch them, each sleeping on a mat; and with this the flock is generally secure from the wolves, who prowl about in the hope of finding some stray or sickly animal on some unguarded point. This race of sheep has spread for a great distance over Hungary, Bohemia, and Austria. The peasants still use the shaggy skins for coats, which are an ample protection from the cold blasts of the northern climate." The tail is large and fat, almost more from its length than its breadth—a characteristic in which it differs from the African sheep, to which we shall now allude.

AFRICAN SHEEP.

In the specimens of Guinea sheep which we have seen figured, the limbs are long, the body gaunt, the ears pendulous, the forehead arched, and two fleshy excrescences hang from the throat. A smaller hair-clad breed extends along the Slave Coast. The Fezzan sheep, of which we have seen examples, closely resemble the Guinea sheep, but have a pendulous dewlap instead of the tassels of skin on the throat. They are gaunt, coarse-haired, ill-formed animals, with high withers like a buffalo. The males have small horns. In Madagascar the sheep are covered with short hair. The South African sheep is of the fat-tailed species; but instead of the long, pendulous, and conical tail, it is broad and flat. All other parts of the body are wolf-like and lank, with the flesh flabby and thin. The tail of this animal is the great furnace which supplies it with heat against the chill and rainy seasons, when caloric is requisite to resist the cold effects of the atmosphere. Barrow, in his work on South Africa, says—"The tail is short, broad, and flat; naked on the under side, and weighs the amazing weight of from six to twelve pounds. It is of a thin oily consistence, and is sometimes used as a substitute for butter. This tail is from twelve to eighteen inches long, and tapers downwards, being five or six inches thick near its setting-on at the rump." The animal is covered with long curly hair, of a powerfully resistive texture, which, from its elasticity, is used for making cushions. The wool varies from black to grey; is often spotted, and sometimes dun and brown. Little care is taken of the breed, which furnish the Hottentot with a large proportion of his food. Nor is their covering more carefully preserved; it being usually allowed merely to drop off in the autumn of the year. Some individuals have a second or under coat, which has a great resemblance to fur, and is used for making coverlets by the superior classes of Boers. A similar sheep occurs in the same or higher latitudes, and they are found in Madras and Bengal. In Northern Africa there is an animal similarly formed, especially in Barbary. It has three, and sometimes four horns; but its tail is thinner and fatter than the variety of South African. Its colour is mostly white; and while the anterior parts are covered with soft hair, the posterior are clothed with fine wool. The ears are pendulous.

THE TARTARIAN SHEEP.

In Tartary, Persia, and other parts of the East, there has long existed a singular variety, with a great deposit of fat on the tail and croup, giving an unsightly appearance to the animal. The tail itself is short, and seems buried in the mass on each side; and the body is generally white; the head and neck black. Of the variety *Ovis Aries, var. Steatopygus*, we have seen a specimen. The fleece of the sheep consisted of short, coarse wool, mixed with hair. This sheep is hornless, and thin and gaunt in its general contour. Its ears are pendulous, and reach to the bottom of the jaw. Its shoulders are thin and small; and its head somewhat deep, but not forward. Behind the shoulders it is small. The legs are also short and thin, as regards the muscular parts; but the whole vital power of the animal seems to tend to the production of the

perfect cushions of fat by the sides of the tail, which absolutely bury it. The female has smaller horns, or is altogether without them. The colour varies, but is usually roan, or of a light brown, mixed cast, while the ewe is black. The wool is somewhat short, and fine in quality. The weight of fat about the rump will be nearly as much as thirty to forty pounds. It must be kept in mind, however, that the fat of the rump of this species is different from the fat of our mutton. On this subject, Dr. Anderson observes—"There is no meat on the body of our common breeds of European sheep, which, in many of its distinguishing characteristics, resembles that of the tail of the broad-tailed sheep of the southern parts of Africa or Asia; far less does any part of the flesh of our mutton bear the smallest similitude to that of the hemispherical bumps on the bullocks of the Steatopagu breed, which so much abounds in the northern parts of Asia. The bumps are called fat, because they resemble that substance in colour and consistency, more than the lean of mutton; but it differs externally from the fat that is found on any part of the body of our sheep."

THE PERSIAN SHEEP.

The *Persian Hornless* sheep is one of the fat-rumped varieties, and is very different from every kind of sheep we have yet described. It is short-eared, and the head and neck are without wool. The body is both deep and cylindrical; whilst the breast is considerably rounded in front. The legs are small and thin; but this is compensated by the rumps, which literally make a pair of cushions of fat, and almost entirely conceal the tail, notwithstanding its great size. The wool is as white as snow, but is short, and not very fine. In the Mosaical sacrifice, there is incidental allusion made to the rump, Moses having taken the fat, and the rump, and all the fat that was upon the inwards. Mr. Youatt quotes this as indicative of the Jewish sheep having been of the fat-rumped variety. The author of *The Cow* gives reasons which induce him to come to an opposite conclusion. There were six parts of the ram to be burned:—1st, the fat; 2nd, the rump; 3rd, the fat of the inwards; 4th, the caul above the liver; 5th, the two kidneys, and the fat that is upon them; and, 6th, the right shoulder. "Now it appears to us," continues the same author, "that these directions rather oppose than support the conclusion that the rump was covered with fat. If so, why did they not specify the fat covering the rump, in the same manner as covering the kidneys? And if the mention of the rump along with other fat parts is to convey the idea that it was fat also, the mention of the shoulder would convey the same impression, which would not be at all accurate. The assumption that the fat was accumulated on the rump and legs, would operate in favour of its also being equally deposited on the shoulder. We imagine that all that was intended was, that all the *best parts* were to be sacrificed in the 'ram of consecration.' The *internal* accumulation of fat, too, is opposed to much *external* formation."

Another fat-tailed variety of the Persian sheep is mixed up with others which develop the fat in other parts of the body. Its wool is of a long hairy grey, and extremely coarse. It, however, has horns. The tail consists of a large accumulation of fat, tending to the pendulous, and has a somewhat conical form. The wool is of a much finer staple than the Wallachian, and is of two kinds—long and hair-like, but thinly scattered, and wiry. There is an under coat, from which the finest class of wools are obtained; and these are said to be equal to Cashmere in their fineness of texture.

The ABYSSINIAN sheep is the same as the Persian; and, according to Mr. Milburn, is but one remove from the Argali, even at the present time. Its habitat is along the shores of the Red Sea. Its tail is somewhat short; its wool coarse and heavy, and of a greyish or brownish colour. The horns diverge from their roots, and are bent so as to make the large form of a circle. The relationship is very close; and it is thought not to be difficult to imagine this long-legged, horned, hair-covered sheep, to be a variety of the Argali.

Among other strange varieties of sheep, may be here noticed the sheep of Syria and Egypt, with a long tail loaded with fat, which sometimes even trails on the ground. In the Egyptian animals the tail is broad throughout, but in the Syrian it narrows to a point. The ordinary weight of the tail is fifteen pounds; but,

in some of the larger kinds, well fattened, the tail will weigh seventy, eighty, and it is said, even 150 pounds. Ludolph saw, in Egypt, a sheep's tail of eighty pounds' weight. This overgrown appendage is a great inconvenience to the animal; and, in order to prevent injury to it, the shepherds are often obliged to fix a thin piece of board to the under surface of the part that trails on the ground, to which small wheels are sometimes added. The caudal deposit of fat in these varieties of sheep is oleaginous, being of a consistence between fat and marrow, and is often used in the place of butter: when the animal is young, this fat is stated to be little inferior to the best marrow. The long-tailed breed *(var. Macrocercus)* is not only found in Arabia, Syria, and Egypt, but is very numerous in the interior and southern parts of Africa, and is covered with a mixture of coarse short wool and hair.

Aristotle speaks of the Syrian sheep in his day, and names a variety which had tails a cubit broad. Such a naturalist ought certainly to be credited. Dr. Russell describes the tails of modern Syrian sheep as weighing fifty pounds; but these are house-fed animals, and exceptions to the general rule. The head is bare, and the horns semicircular, and bending downwards. The ears are pendulous, and the face free from wool. The throat is covered with long shaggy hair, projecting almost as far forward as the mouth. The posterior parts are woolly, and the tail reaches nearly to the fetlock joint; but, before it extends that length, it makes an upward turn at its pointed tip.

THE ICELAND AND FAROE ISLAND SHEEP.

Leaving the regions of the East, and coming nearer our own island, we find that in Iceland and the Faroe Islands, there are two races of sheep—one of a small size, and of a dun or rust-black colour; the other of larger size, and white. Both of these races are remarkable for the number of their horns, varying from three to eight. Four, however, is the usual number. The larger race are strongly-built animals, with a coarse fleece, consisting of long hair externally, and an under-layer of close wool, impenetrable by the heaviest rain. The wool, however, is of little value, being fit only for horse-cloths and common rugs. These sheep yield an extraordinary quantity of milk, far superior to that of any of the more southern breeds. Von Troil, in his *Letters on Iceland*, states that a single ewe will yield from two to six quarts a day. The Faroe Island race of sheep is of great antiquity, and wild. They are covered with black, short, curled wool, and their flesh has a peculiarly dark appearance, and venison-like flavour. When Mr. Trevelyan visited these islands, he found the remnants of this wild race in no way dependent upon or under the control of man. They are sometimes caught by dogs; but can seldom be obtained, except by being shot, or intercepted in a narrow space, and driven over the cliffs.

THE ALPACA AND THE LAMA.

The alpaca and the lama, or Peruvian sheep, are natives of the Andes, in South America. The lama is somewhat taller than the alpaca; and, though in some respects a remarkable animal, its peculiarities are not such as to render it, for purposes of practical utility, so especially interesting as the alpaca, out of its native regions. The alpaca—which it is proposed, under the most respectable auspices, to domesticate in Britain—is an animal combining the appearance of the common European sheep with that of the goat, and partly of the deer and camel. Like the sheep, it is lanigerous, or wool-coated; in its general structure it is light, and possesses limbs adapted for springing and leaping like the goat. It resembles the deer in skin, flesh, and general appearance; and though without the camel's deformities, it is gifted like him with patience and docility, being often used as a beast of burden by the natives of South America. The height of the alpaca is from three to four feet, when measured from the ground to the top of the back; the eyes are large, black, soft, and expressive; the animal has no horns; the neck is long, slender, curved backwards, and finely set; the head handsome, and the muzzle and ears lengthened. To common observers, the alpaca might seem to be a fine tall goat, with small head and no horns, but of more gentle and fleecy appearance than that animal. The fine quality of its wool forms, of course, a point of peculiar importance, taking into view the fact of its having been introduced to Europe. The flesh is also delicious. The experiment of keeping these animals in Great Britain has

been tested, and with some success. The Earl of Derby has, at Knowsley, a flock of lamas and alpacas, which not only live, but multiply. The wool, it is said, is improved by our pasture. These animals also adorn the pleasure-grounds of the Marquis of Breadalbane, the Duke of Montrose, and other noblemen and gentlemen. Their first introduction to Europe is due to the Spaniards.

The alpaca was, after great difficulties, and many misadventures, introduced to Australia, in 1855, by Mr. Charles Ledger, an English merchant, established many years at Tachna, in Peru. In 1852, this gentleman proceeded to Sydney, for the purpose of fixing on the most favourable localities for the pasturage and breeding of alpacas. Having satisfied himself as to the capabilities of the country, he returned to Valparaiso in 1853; crossed the Cordilleras in the same year, and rejoined a flock of about four hundred, which he had purchased previously to going to Sydney. Overcoming a thousand obstacles, he succeeded in procuring about three hundred and fifty more of these precious animals, in order to supply the place of others he had lost during his absence, by the neglect of those whom he had left in charge of them. This great reverse, which would have overwhelmed any ordinary mind, acted on him as a stimulus to renewed exertions. He was, however, at this stage, brought to a standstill by want of pecuniary resources; and, to his great regret, compelled to return to Valparaiso. Here he speedily procured the amount required, and undertook, with greater confidence than ever, new wanderings through the desert solitudes of Peru and Bolivia, in order to recruit his diminished flock. Finding himself under the necessity of deceiving the different governments, in order to withdraw his flock from the Peru-Bolivian territories, Mr. Ledger divided his alpacas into three divisions, and commenced his march, by different roads, to the Argentine Republic. The details of this remarkable journey, the obstacles, both natural and artificial, which had to be overcome, form the subject of a journal full of incident and hardships of all descriptions. After losing nearly one-half of his alpacas in a very severe snow-storm, which, lasting without intermission for nine days, placed the lives of even the drovers in jeopardy, Mr. Ledger succeeded in re-uniting two parts of his flock in the province of Sulta, Argentine Republic, during the month of August, 1855. During this part of his journey, he had to be constantly on his guard against the machinations of the Bolivian authorities, who were untiring in their efforts to procure the destruction of the flocks. The most active agent in endeavouring to carry out this malicious purpose, however, was defeated in his object. In the same month, the third division of his flock was seized in San Pablo (Bolivia); but at length, in February of the following year, he was enabled to deceive the vigilance of the espionage under which he was placed, and escaped with his alpacas from the Bolivian territory. Mr. Ledger now commenced his march on the valley of Calchaquies, his object being to proceed to a spot where "alfalfa" was cultivated, in order to habituate the animals, by degrees, to this species of pasture, both fresh and dry; thus preparing them for their ultimate shipment, by giving them a little dry food every day. Whilst resting, after the accomplishment of this portion of his task, a terrible calamity overtook him, and upwards of two hundred of his precious flock died suddenly, after drinking the water of one of the lakes, which was infested with leeches. This great loss involved the necessity of once again setting out in search of a more suitable locality; and although Mr. Ledger had been separated twenty-two years from his native land, and more than five years from his home and family, he determined to devote another year to the purpose of recruiting his diminished flock. The enterprise was one well worthy of the labour and difficulties which it involved, being nothing less than transporting, from the loftiest peaks in the world, and introducing to Australia, an animal which appears destined to work out two great revolutions—the one in the breeds of wool-producing animals, the other in the fabrication of woollen textures. On leaving the valleys, he kept the mountain sides, avoiding the leech-infested lakes, and giving his flocks the advantage of the invigorating air of the highlands. Here he recommenced his wanderings, travelling very slowly, notwithstanding the extreme severity of the weather, which tried him greatly both by day and night; and,

finally, arrived at Laguna Blanca. Being satisfied that he had now arrived at a desirable spot for the propagation of the species, not only did he, in time, acquire a new flock of alpacas, acclimatised to temperatures less pure and rigorous than those in which their predecessors had been reared, but succeeded in educating them, to a certain extent, for the great voyage which lay before them. For himself and people he built a hut of stones, which furnished an indifferent shelter from the inclemency of the weather. For the animals, large yards were enclosed, and provided with troughs, in which they were supplied with their daily rations of dry alfalfa, cut up and mixed with bran, to which they became gradually accustomed. Twice was Mr. Ledger arrested by the authorities, and twice did he effect his escape—once by exercising his medical skill in the cure of the wife of the detaining prefect, and next by mixing laudanum with the grog of his military custodier.

The safe arrival at Sydney of the flock of alpacas was a great evidence of the skill, daring, and perseverance of Mr. Ledger, and deserves grateful acknowledgments on the part of a discerning public. "We hope," says the editor of the *Sydney Morning Herald*, "that it will be found that the enterprise will pay in some measure for the labour and the sacrifice. It is, unfortunately, too true that benefactors are themselves rarely benefited; that the cost of experience, and the toil of primary steps towards success, often obtain no return for those who first adventure on a new undertaking. Thus, the fate of inventors and discoverers is proverbial. It requires time to test the value of their labours—to silence detraction—to realise the fruits of their enterprise—to place their merits conspicuously before the world; and it often happens that those who have most served mankind, never hear the unmixed melody of praise: their services are only appreciated when it is impossible to reward them." The government of New South Wales purchased Mr. Ledger's flock for £15,000, and secured his services for five years, allowing him £1,300 per annum for their maintenance and superintendence.—Such is a condensed narrative of only some of the difficulties which attended the introduction of this valuable animal to the shores of Australia.

THE SPANISH MERINO SHEEP.

Among the breeds of Europe which have attained to the highest celebrity, and by means of which, through judicious crossing, the sheep of Saxony, Prussia, Austria, and England have been greatly improved as respects the quality of the fleece, is the far-famed Merino of Spain. The term "Merino" alludes to the over-sea origin of the race; and there are good grounds for believing that these Spanish sheep are originally of British extraction, being of the old Ryland or Cotswold stock. Stow and Baker, in their Chronicles, say—"This yere (1464), King Edward IV. gave a licence to pass over certain Cotteswolde sheep into Spain." Baker adds—"King Edward IV. enters into a league with King John of Arragon, to whom he sent a score of Costal ewes and four lambs."

This is a breed so far superior to all others of the ovine race, for the production of fine wool for the manufacture of our most costly cloths, that its breeding and culture have received the greatest attention in every quarter of the globe. There is no country where these efforts have better succeeded than in Spain, except, perhaps, in Australia, where the breed has been brought to the highest perfection. The origin of this breed is involved in darkness; but it is supposed to have been introduced from Barbary, probably about the time when the Saracens were making their conquests in the Iberian peninsula. This, however, is mere conjecture; but Spain has long been distinguished for the excellent quality of her wools. Ancient writers make several allusions to this fact; and Columella mentions a cross made with the Tarentine breed by his uncle, a farmer or herdsman of Bœtia. This was effected with some wild rams of an extraordinary colour, which had been imported to Cadiz from Africa. The Bœtis, or Guadalquivir, was said to have brown or grey wool; and Pliny remarks that it had a red covering. Martial was a Spaniard, and he praises the wool of Bœtia; whilst Strabo, speaking of that of Turdentia, says—"Much cloth used formerly to come to this country. Now, also, fleeces come from it more than from Coraxi, and they are exceedingly beautiful, so that rams for breeding are sold for a talent each. Also the *fine webs* are very famous,

which are made by the Saltatiæ." From all these testimonies, it may safely be concluded that Spain has long been celebrated for its wools, for which it, no doubt, owes something to climate, as well as to the constant care, and the admirable management in the feeding and breeding of the flocks. This once famous country, however, has fallen from her high estate in the scale of nations. She no longer conquers, but succumbs; whilst her cloth manufactures have almost ceased to exist.

There are other breeds of sheep in Spain, besides the Merinos, more or less intermixed with them; but of the pure race, it is calculated that there are about ten millions, which, excepting, perhaps, the flocks of Leon and Estremadura, are migratory, and termed *transhumantes*, being periodically conducted from one part of the country to another, and back again. These *transhumantes* are divided into flocks, which, under the care of a mayoral or chief shepherd, and assistants, migrate from the mountains of the north to the plains of the south in winter, and return to the mountains in summer. The flocks follow the shepherds, who lead the way, and direct the length and speed of the journey. A few wethers, perfectly tamed, tread in the footsteps of the conductor, and the rest follow in due order. A powerful breed of dogs accompany the shepherds, in order to defend the flock from wolves; and a few mules carry their provision and other necessaries, as well as materials for making up the fold at night.

This migratory system is regulated by a tribunal termed Mesta, which is of such long standing as to be traced back to the middle of the fourteenth century, at which period definite laws with respect to it were enacted. These enjoined, that persons were not to travel along the course of the route pursued by the flocks while the sheep were in motion; they also established a right to graze on all the open and common land that lay in the way; and, moreover, assigned a path, ninety yards wide, through all the inclosed and cultivated country. The journey taken by the Merino flocks is upwards of four hundred miles, which they accomplish in six or seven weeks, and the same time is spent in retracing the route; so that, in every year, about fourteen weeks (or nearly a quarter) are spent in these toilsome journeys. Popular prejudice, in Spain, attributes the superiority of the Merino wool to this practice—a practice injurious to the agriculturists, through whose corn-lands and vineyards the flocks pass, and injurious to the keepers of stationary sheep; inasmuch as the common and pasture lands are completely eaten bare by the multitudes that slowly pass over them; while wilfully, or through carelessness, serious damage is done to farms, plantations, fields, and vineyards, for which no redress can be obtained. It is, however, much to be doubted whether the Merino wool owes its superiority, as is asserted by the Spaniards, to this system. The stationary Merinos in Leon and Estremadura, produce wool equal in quality to that of the migratory flocks; and these are again exceeded by some of the German Merinos, which never travel. Thus it would appear that the advantages of the Mesta system have been overrated; while the evils resulting to the flocks from fatigue, and the injury done to the lands in their course, have been treated with indifference.

THE SAXON MERINO SHEEP.

This is the same breed as the preceding, differing from it only in accordance with the different management adopted in its rearing and tending. It is not very migratory, and it receives far more attention than the Spanish Merino. The flocks are clothed and sheltered, and furnished with covered buildings provided especially for them; and, like the horse of the Arab, are esteemed as nothing less than members of the shepherd's family. In summer they are depastured in the open air during the day; but when night comes on, they are either clothed or driven into their sheds. This is a very ancient practice. In the days of Columella, the Tarentine sheep were covered with skins, and denominated "soft;" but whether the term is meant to apply to their wool or their constitutions, appears uncertain. In a modern sense, we should think it was meant to designate the latter. Columella says that these animals were principally reared in the house; that great care was necessary to be bestowed upon them in regard to warmth, food, and cleanliness; and that, in his time, a similar practice was pursued in Spain, and adopted by the Romans who settled in the north of Gaul.

With a view to acclimatise this valuable breed of sheep in England, frequent attempts have been made. The first took place in the reign of George III., who, himself, made the experiment, and took a deep interest in its naturalisation in our island; but the fates proved adverse. The losses were so great as not to be compensated by the extra value of the wool; while the absence of mutton would have been a want to which the English flesh-loving people would never submit. They preferred the fine and short wool of the Down, though far inferior, because it was accompanied by a superior class of mutton. The wool did not, however, degenerate; but the lowland pastures of England, with their rich luxuriant grasses and succulent herbage, were too strong for the Merino. The first experiment was made in 1791, from a very fine flock presented to his majesty; but in this country they degenerated, and seemed to become less hardy than when they were imported. The next was made by the then Marquis of Breadalbane, who resolved to adopt all the skill and care that could be suggested, in order to secure the safety of the flock. The sheep were housed, or shedded, at periods when other breeds were exposed. They had the best of keeping—perhaps an error arising from the endeavour to increase the mutton; but the three shear wethers could not be made to exceed 64 lbs. each, except in very rare cases, and these not more than 72 lbs.; while less pampered breeds realised nearly double these amounts of weight, and at an earlier period of their lives. The humidity of the climate seemed to bear hard upon their constitution, as they became weak under it. Lord Western also devoted considerable time and attention to the breeding of Merinos in this country. His chief efforts were directed to crossing with the Leicester; but while the frame and mutton of the animals seemed to improve, the wool in some degree varied. He obtained it, however, of a beautiful texture, and of great length; but it was not quite the Merino wool.

An experienced and well-known agriculturist favoured Mr. Milburn with the following remarks on the Merino breed, which are worthy of the deepest consideration:—

"Although the importance of this breed of sheep, at the first glance, may not be fully recognised (for they are little known; and, since the deaths of Lord Western and Mrs. Dorien, have only been bred by Mr. Sturgeon, of Grays), a little reflection will show that it can hardly be overrated; for it is this which supplies our colonists, at the Cape and Australia, with the fresh blood which the nature of their climates renders periodically necessary. In the latter colony gold may now absorb the greatest attention of its population; but we must not forget that wool was the foundation of its rapid growth and prosperity, nor overlook its importance in finding employment for our ships and our manufacturing artisans, by its successful cultivation. The Merino sheep is more distinguished for the quality of its wool than for other excellences. It presents a very peculiar appearance—the face is beautifully soft and white; a little rise is perceptible on the points of the shoulders, as also on the back of the head; the knees incline slightly inwards, and the legs are covered with wool to the feet. The rams are horned, and the ewes almost invariably polled. The Merinos exhibit a remarkable tendency to throw out horn, their feet growing so rapidly, that it is necessary to use the knife where they have not travelled much—a provision of nature, seemingly designed to fit them for the migratory life of their ancestors They endure wet weather, or low situations, with difficulty; but, in hot weather, no sheep appear in better condition."

It is stated by Mr. Sturgeon, that our climate seems to affect both the carcass and wool of imported sheep. Nature would, therefore, appear to refuse to give the *finest* wool to the *largest* carcass. Mr. Sturgeon's exertions, for many years, appear to have induced some relaxation in his favour; for on sheep that would, if fatted, weigh ten or twelve stones, we find a quality of wool that can hardly be surpassed; and such sheep as (possessing the requisites of size and form, *and the constitution peculiar to English-bred animals*) must always be in request by our colonists, and have the preference over the German-bred animals, which seem to want the size, form, constitution, and length of staple they are sent to restore. Mr. Sturgeon's Merinos were the result of an amalgamation of the flock of his majesty George III. with those of Lord Western and Mrs. Dorien.

In Spain, as in the East, from the earliest times, the shepherd leads his flock. In Italy, in Greece, and some parts of France, it is still the custom; and the reed-pipe of the shepherd may be heard calling the flock together, or the troop be seen following him as he leads them to their evening folding-place. In Greece, it is usual, as formerly, to give names to the sheep, which they know, and will answer, coming to the shepherd when called.

Before closing this chapter, let us revert to our starting-point—the question as to the origin of the domestic sheep? It is clear that we cannot identify it with any wild species with which we are yet acquainted. If such exists, it is most probably to be found on the mountains of Armenia—but this is problematical; and there is some ground for supposing that, though the sheep of every region intermingle with each other, they have descended from different primitive origins. The subject is full of obscurity It is, indeed, strange, that while history teems with the accounts of battles, massacres, invasions, the reigns and the crimes of kings, it throws no light upon the domestic animals which man has reclaimed. The motives which led him to attempt this important work, the manner in which he accomplished it, the characters and native abodes of the species selected, are buried in oblivion. The subject was too mean for history—the actors too humble to be noticed; but it is always the case, that the glare of mighty deeds effaces the record of the useful, the beneficent, and the truly great; whilst that which is in reality mean, is magnified.

CHAPTER II.

BRITISH SHEEP.—LONG-WOOLLED BREEDS.

PRELIMINARY REMARKS.

Traditional testimony, as well as the oldest records, are very unsatisfactory regarding the existence of the sheep in Britain; and no early historian whatever deigns to take the slightest notice of them. Whether this neglect has arisen from their, perhaps, comparative unimportance in those times in this country, it is now impossible to say; but even Cæsar, who enters at considerable length into a description of the manners and customs of the ancient Britons, does not make the most distant allusion either to the sheep or its wool. When he mentions the cattle of the ancient Britons, however, it is probable that he meant sheep to be included; as Herodotus, when speaking of the Persians, says—"The wealthy provide an ox, a horse, a camel, and an ass, roasted whole in furnaces; and the poor provide the smaller cattle." This is said in allusion to the feasts of that people. After the subjugation of Britain, the Romans turned their attention to the improvement of the country, cultivating the soil, and gradually bringing about an order of things very different from that which had hitherto existed. Among other acts, they established a woollen manufactory at Winchester, which, as a matter of course, must have been supplied by native fleeces, as there was no other source whence these could be obtained. This speculation succeeded so well, that, in a very short time, the woollen cloths of Britain entered into competition with those of the Roman empire, and early began to excel them. This was soon evidenced by the fact, that the finest and most costly dresses made use of on days of ceremony and festivity at Rome, were the product of British wool. The sheep employed in furnishing the material for these manufactures, were the short-woolled breed—Winchester being situated in the centre of a county which was then favourable to the support of that kind of sheep alone. From this period a darkness falls upon the history of the sheep and its productions for some centuries, until an old chronicler appears, and gives a

pleasing picture of the manners of the age in the time of Alfred, of whom it is said—

"His godemother ofte smal gyftes to him she kindly toke,
For to leve o'ther plé, and loke upon his boke."

This godmother seems to have had a just appreciation of the genius of Alfred, and is said to have been skilled in the spinning of wool, and to have busied herself in training her daughters to the same employment. From this circumstance, it would appear that the *long wool* had now begun to be employed, although the manufactures of the Winchester mills continued to be held in due estimation. In point of fact, remote as this period is, the woollen manufacture may be said to have already begun to assume a considerable degree of importance, as various breeds of sheep were cultivated, and different kinds of cloth made, so as to constitute it the principal source of employment and wealth in the country. At the time of the Conquest, we find it stated, that an acre of land and four sheep were about the same value. In the Saxon period, sheep were valued at one shilling per head until fourteen weeks after Easter, when, in all likelihood, they had attained to a higher condition from the grass having sprung up, and, consequently, affording a better supply of pasture. Both in 1041 and 1125, a great destruction took place among sheep on account of some destructive epidemic; and this might be one reason why the price of sheep, subsequently, became much higher. In the reign of Henry I. the price rose to 20*s.*, and in that of Henry II., 25*s.* In the earlier part of the fourteenth century, a variety of breeds had been cultivated, and the prices for the different kinds of wool varied considerably. The produce of the Shropshire sheep was sold at £9 6*s.* 8*d.* per sack; whilst the Cornish wool, no doubt the produce of a mountain or forest breed, was only £4 per sack.

The first determined and general improvement of the sheep took place in the reign of Henry III.; but the great impetus to sheep-farming was given by the introduction of turnips. This well-known plant is cultivated for its bulbous roots, both in the garden and the field, and was originally introduced from Flanders into Norfolk two centuries ago, and from Norfolk was carried into the south of Scotland and the north of England, about a century after. In 1684, we find Mr. Worlidge saying—"Sheep fatten very well on turnips, which prove an excellent nourishment for them in hard winters, when fodder is scarce; for they will not only eat the greens, but feed on the roots in the ground, and scoop them hollow even to the skin. Ten acres sown with clover and turnips, will feed as many sheep as one hundred acres would have done before." Previous to the introduction of this invaluable root, it is not easy to see how large flocks of sheep could be kept alive throughout a long winter. It must be remembered that flocks were so extensive as to require a vast amount of provender. Harrison, who wrote a century before Worlidge, says that the farmer possessed as many as 20,000 sheep, notwithstanding that an act had been previously passed restricting one man to the number of 2,000. In 1662, according to the Berkeleyan MSS., the price of a "sheepe was VI.SS.;" and, according to the same authority, in the time of Edward I., "a fat sheepe was worth from XVII.d. to XX.d., a lambe X.d.;" "a weight of woll," in Richard II.'s time (twenty-one pounds) "was V.S." Distinctions between grass-fed and corn-fed sheep—winter and summer mutton—were made by act of parliament in 1314. It determined the price of a "corn-fed sheep." "A lambe" is spoken of as being worth X.d. or XII.d. in the reign of the first Richard. In 1699, there were said to be twelve millions of sheep in Britain, and the carcass value of each was 7*s.* 4*d.* The fleece averaged about 10*s.* 4*d.*; and the boast of the writers of the period is, that "no country but England and Ireland, having a sward or turf, would bear sheep producing the wool of which the English draperies were made." They were willing to let the Spanish wool have the palm for the costly dresses of the peer; but it was insignificant—"not above 9,000 pieces of these Spanish cloths were sent abroad;" and these were only for the "wear of the richer sort."

We will now consider individually the various breeds which have obtained amongst us, and which we will class separately, under the heads of *long-woolled* and *short-woolled* species. Before doing this, however, we will

give, from Mr. McCulloch's *Dictionary of Commerce*, the following compendious view of the more prominent characteristics of the various breeds:—

Names of Breeds.	Wool.	Weight of Fleece.	Wethers per Qr.	Age killed.
		lbs.	lbs.	
1. Teeswater	Long wool	9	28	2
2. Lincoln	,, ,,	10	25	2
3. Dishley, or New Leicester	,, ,, (fine)	8	22	2
4. Cotswold	,, ,, ,,	9	24	2
5. Romney Marsh	,, ,, ,,	8	22	2
6. Dartmoor, or Brampton	,, ,, ,,	9	25	2
7. Exmoor	,, ,, (coarse)	6	16	2
8. Black-faced or Heath	,, ,, ,,	3	15	3½
9. Hereford—Ryeland	Short ,, (fine)	2½	14	3½
10. Morf., Shropshire	,, ,, ,,	1¾	12	3½
11. Dorset	,, ,, ,,	3½	18	2
12. Wilts	,, ,, (Mid.)	3	20	3
13. Berks	Long ,, ,,	7	18	2½
14. Southdown	Short ,, ,,	2	18	2
15. Norfolk	,, ,, ,,	2	18	3½
16. Herdwiek	,, ,, ,,	2	10	4½
17. Cheviot	,, ,, ,,	3	16	4½
18. Dun-faced	,, ,, ,,	1½	7	4½
19. Shetland	Fine ,, ,,	1¼	8	4½
20. Spanish	Short ,, (super)	3½	14	2½
21. Ditto Cross	,, ,, (fine)	2¼	6	2

THE TEESWATER.

Properly speaking, the long-woolled breeds of sheep originally belong to the rich and marshy pastures of England, whence, with the advances gradually made in agriculture, they have extended to all parts of Britain; and, in many localities, have encroached on the land previously appropriated to the short-woolled breeds. From this circumstance they have, for many years, been increasing in numbers, while the others have been either decreasing or remaining stationary. This is to be accounted for by the fact of the long-woolled varieties being more profitable than the short-woolled, provided they are pastured upon such land as may be found agreeable to their nature. When this is the case, they produce a much greater weight of fleece, which yields as much per pound as that of the others; while the earlier maturity, and the superior fattening qualities of one particular variety, render them a much more preferable stock to the others. Yet, it has been observed, that whilst many of the mountain or up-land breeds have been preserved in a state of purity from remote ages, most of the ancient long-woolled breeds have either altogether disappeared, or been preserved, by the curious, in individual flocks; they have either been changed by extensive crossing with the New Leicester breed, or altogether supplanted by it. A distinction has been made of two classes of long-woolled sheep; one belonging to the fens and marshes, and the other to the inland plains. The former embraces the Teeswater, the Leicester, and other varieties; and the latter, the Lincoln and the Romney Marsh.

The Teeswater is a very large breed, and may, in some degree, be considered the giant of the fleecy tribes, as it will frequently attain to the heaviness of 50 lbs. per quarter, or 240 lbs. weight. The fleece is long, very open, and somewhat coarse. It weighs from 9 to 12 lbs. This breed of sheep is very old, and, for a long space of time, has been located on the banks of the river Tees, whence it takes its name. Most writers class it with the Lincoln sheep, from which it is supposed to have derived its origin. This, however, is very uncertain. "The principality of Durham," says Mr. Milburn, "celebrated for its native wild cattle and pigs, had doubtless its own peculiar breed of sheep and cattle; and the old Teeswater sheep had as much a habitat in those rich pastures as the wild cattle of Branspeth, or the deer at Auckland Palace. The great peculiarity of the animal was its slow growth, and, at the same time, its large size and bone, its heavy, thin, and coarse wool. The length of the legs, in particular, gave it an imposing and somewhat ungainly appearance; while its thick skin made it a slow feeder in any but its native pastures—the alluvial washings of many generations." At one period, this gentleman obtained two lambs, as a great favour, from a flock of pure Teeswaters. The farmer forbade his taking two of his best animals, and he had to be contented with one. He selected another, so close in the pelt, and so unsymmetrical, that he decided in putting it off. The best was well kept, and astonished both himself and his visitors by its amazing size, and the great weight and quantity of its wool; but, just before shearing, it died the victim of wool and mutton. As it was skinned, and not shorn, there was no mode of weighing the fleece; but it could not be lighter than 12 lbs. The load of fat, added to the envelop of heavy wool, seemed to have suffocated the animal, for it was exceedingly well kept.

Pure Teeswaters are now very scarce. As

we have already observed, they have all, more or less, been improved by crosses with the Leicesters; and a more beautiful cross can hardly be seen. The Leicester shortens the leg; but it also shortens the wool. Still, the cross so far keeps up the character of an open fleece, that it is excellent in a point where the Leicester is somewhat deficient. The cross is always the substitution of a Leicester instead of a Teeswater ram to a Teeswater flock of ewes. The finest animal shown at a meeting of the Royal Agricultural Society at Liverpool, was one of these crosses; but it was excluded because it was not a pure Leicester. "Long-woolled," however, was a term soon after substituted for Leicester, so as to admit sheep of this description to compete. The old Teeswater was a large, full sheep, of ungainly form, with a coarse head, rounded haunches, and long and large limbs. Other large breeds formerly existed in the midland counties, but most of them were smaller than the Teeswater. These and similar breeds, however, have now altogether disappeared in England.

The Teeswater sheep thrive best in small flocks, and when they are dispersed over pastures with other stock, rather than when they are crowded on the ground. The ewes are very fruitful, and usually produce two, and often three lambs at a birth. They are excellent mothers, and famous milkers; and though almost incapable of being brought up to a state of fatness at one year old, they will weigh 25 to 30 lbs. per quarter at the shear without difficulty. The contest respecting large and small sheep on good land, and the most politic course for breeding and fatting, is by no means settled.

KENTISH OR ROMNEY MARSH SHEEP.

The Kentish, or Romney Marsh sheep is not, in its external characteristics, unlike the Teeswater: it inhabits a locality to which it is peculiarly adapted. In the northern and eastern districts of this county, there is much open ground, covered with short pasture, upon which this variety thrives amazingly. Sir Richard Phillips says of them, in his day—"The marsh lands of Kent, used for breeding sheep and fattening cattle, are 82,000 acres; of which Romney Marsh is 41,000. It has fourteen miles in length, and ten in breadth, and for the greater part consists of a rich clay soil, well adapted for rearing a large breed of sheep. This had been reclaimed, at some time, from the sea." Sir Richard again says, "that four sheep will live on an acre of moderate land in summer, and two in winter." The proportion is now quintupled, but the season is reversed. He then laments "the deterioration of the wool of the Romneys; for the wool of sheep deteriorates as the sheep's carcass increases; hence, for some years, owing to the enlargement of the English sheep by new breeds, the wool has become too long and coarse for fine cloths. Our long and coarse wool will not unite or produce the required substance for clothing."

The head of the original Romney Marsh sheep is large and thick, and covered with a white woolly tuft. The forehead is flat and broad, the neck long, and somewhat small for the size of the animal. The loin and back are wide, but the sides are flat, and the belly is deep. This exaggerates a naturally narrow, and not very deep chest, so as to make it appear still less favourable. The legs, speaking of them in the sense of mutton, are large and broad; and the hind quarters generally are better developed than the fore. The wool is long, but fine, and very suitable for combing. It weighs about nine pounds per fleece. The mutton is good in quality, and the weight is often 140 lbs.; and, in some cases, 150 or 160 lbs.

The race can bear cold, wet, and eastern exposure. Formerly they were fed, both winter and summer, on grass and a little hay, and were seldom provided with shelter; so that, not unfrequently, the lambs all died, and the ewes suffered from the cold and wet. The long-established custom of the Romney breeders has been to send their lambs to the farmers on the uplands, to be fed during the winter; but they are usually kept very hard, chiefly on the stubbles for a long time, when they are often greatly debilitated before they are transferred to the pastures. They are rarely allowed hay—a kind of economy which sometimes proves very destructive to the stock. In the management of the ewes in the marshes, the same negligence and want of care are apparent. However severe the weather may be, shelter is very rarely afforded them; but

where this is done, it amply repays the cost and trouble in the lives which it saves. The breed, however, is now seldom found in a pure state, as it has been extensively crossed with the New Leicester, which has greatly improved its form. The effusion of Leicester blood, says Mr. Milburn, "effected a change, possibly for the better, on the old Romney Marsh sheep. It made a finer animal, reduced the quantity, but not the quality, of the wool; deepened the chest, and increased its width; rounded the rib, and lessened the bone generally; drew up the belly, and destroyed the tuft of hair on the top of the head; so that it made the sheep altogether a better feeding animal, without destroying its suitability to the soil and climate which it had inhabited for years. With its other improvements, the cross had also the effect of reducing the period of bringing the animals to market. They were usually three years old before they were sold to the butcher for killing. They are now prime for the London market at two; and as this enables the feeder to turn over one-third more capital in sheep-fattening, it is a great advantage, though he has possibly somewhat injured the hardihood of the animal; and it now requires a greater amount of care and skill for the bringing up of the lambs. Nor has the wool been so far injured as to prevent the breed from being classed among those celebrated for this commodity. The Leicester may have shortened a little, and made the fleece set closer on the body; but it has neither destroyed its fine texture, nor prevented it from standing high in the estimation of the manufacturer."

THE LINCOLNSHIRE SHEEP.

This breed bears a strong resemblance to both the Teeswater and the Romney Marsh or Kentish sheep, and, in all probability, had a similar origin to them. The Lincolnshire fens extend into Norfolk, Cambridgeshire, and the adjoining counties, and are well suited for the rearing of a large race of sheep; and, accordingly, they form the native habitat of the Old Lincoln—a breed in its pure state, we believe, now almost quite extinct. They were of a large and coarse make, with hollow flanks and flat sides, large legs and feet. Their fleece almost touched the ground, was long and oily, and weighed from 10 lbs. to 12 lbs., and upwards. They fed slowly, but accumulated a great deal of internal fat, and were, on that account, much sought after by the butcher. This was the Old Lincoln, the progenitors of the present existing race, which has been improved by extensive crossing with the New Leicester, and which Mr. Milburn describes as having been of great value. He says that they have smaller faces than the Romney Marsh sheep, and are altogether lighter in flesh. The carcass is large and coarse; the length, from the head to the tail, measuring, in some cases, four feet six or seven inches. It is to this great length that he attributes the apparent hollowness which this variety has in its back. The ribs are flattish, and not covered very thickly with flesh; whilst the belly is deep, and the shoulders so forward as almost to hide the breast. The neck is thick and large, and is encumbered with a deep and flabby dewlap. The hind quarters are full and fat, with a tendency to accumulate fat at the rump. The legs are fleshy and deep. The whole animal is of an ungainly form, taking the standard of connoisseur taste as a criterion; but, when the wool covers the animal, the whole of his imperfections are hid. He is one living square of wool, ranging from fifteen to eighteen inches long; and more of this material is clipped from the Lincolnshire sheep *than from any English sheep whatever*. The fleece varies from 12 lbs. to 14 lbs. weight, which, when it sells for 15*d*. or 18*d*. per pound, is equal to the value of the whole carcass of some of the smaller breeds of sheep. Nor is it far behind in mutton. The wether will weigh from 30 lbs. to 35 lbs. per quarter, sinking the offal, or a nett weight of mutton, per sheep, of 140 lbs.

The effect of crossing this animal with the New Leicester has been to reduce the size, diminish the length, and to restore the power of internal accumulation of fat, and also to deposit it externally on the sides and back of the sheep.

Messrs. Kennedy and Grainger state, that the sheep bred in the wolds are deeper crossed with the New Leicester than those in the marsh lands, which may account for the fleece of the latter being heavier. "The breed of sheep generally," they observe, "has been greatly increased since the turnip husbandry has been introduced. Those bred in the wolds,

and, indeed, in every part of the district where this system is pursued, are reared chiefly on artificial grasses. There are, however, great numbers bred on old pastures, the best of which are kept for the purpose of fatting sheep." The effect on the wool, as to quantity, certainly depends on the degree of Leicester blood infused. The lowland sheep, when the infusion prevails to a smaller extent, have a large massy frame of flesh, covered and grained with fat. They are compact and kindly feeders, though they require more food than when a larger proportion of Leicester blood prevails, and cannot either be put on land so inferior, nor on any land in the same average quantity. Their produce of wool is very great. A wether killed at Grantham, one of an equal lot of twenty-seven, clipped 17 lbs. of wool, and weighed almost 308 lbs. The sheep are always sold at two shear, and the united clip—the one made as a shearling, and the other at two years old—will often average 20 to 25 lbs. When fatted to the utmost extent, a wether has been known to weigh 300 lbs., and a ewe 262 lbs. Such instances exhibit the power of these large-framed sheep to produce both wool and mutton. Assuming a choice specimen to be two shear, his whole produce will be—

	£	s.	d.
Two fleeces of wool, 24 lbs., at 1*s.* 3*d.* . .	1	10	0
Carcass, say 250 lbs., at 5*d.*	5	4	2
Total	£6	14	2

With higher prices, of course, the value of the animal would be more; but this is sufficient to show that the Lincolnshire sheep, when not far removed from its original stock, is an animal very remunerative both as to wool and mutton.

THE DISHLEY, OR NEW LEICESTER SHEEP.

The *Leicester*, or the *New Leicester* sheep, had its type in the Teeswater, the Lincoln, and the Romney Marsh breeds. It was a large, heavy, coarse sheep, with a disposition to feed favourably, but with much grossness about it. Its wool, however, was excellent for combing. The rams would weigh, when fat, 40 lbs. per quarter; and the fleece would weigh 13 or 14 lbs. It was on these animals that Bakewell began his experiment, with a view to improvement; and, in 1760, he commenced the system of letting rams, as distinguished from selling. The usual course was for the farmers to save the best of their several flocks, and reserve them uncastrated, as male lambs. Bakewell began a letting system; but so little was it liked, and so little was thought of his rams, that he let one in that year, for the season, for only sixteen shillings; and it was not till twenty years afterwards, that anything like a remunerative price was received. It was then only ten guineas for one ram; but it afterwards rapidly increased, till, in 1786, he received 300 guineas for one ram; and, three years afterwards, he realised no less than 6,200 guineas, thus rewarding him for his unwearied perseverance, under almost every species of discouragement and opposition. Subsequently he established the Dishley Society, with the view of extending the breed, preserving it pure, and benefiting the members of it. As an improver of the breed of sheep, this gentleman stands alone; but how he accomplished the great points he achieved, remains a secret, for the plan he adopted died with him. It is certain that he reduced the size of the native animal, and gave him small offals, induced him to lay on flesh and fat all along the breech, the sides, the shoulders, the flank, and the neck; opened his wool, and also reduced it in weight, and a little in length. He likewise increased the tendency to lay on fat in proportion to the food consumed, and made the animal take on fat a year or two earlier at least, and thus enabled two or three animals to be fed where one only could be kept before. All this he did; and the same breed of sheep has, for a century, not only maintained its position, but has been employed, with more or less success, to improve nearly every breed of sheep in the United Kingdom, and, at the same time, has more or less displaced almost every other breed.

The various points of the New Leicester have been thus accurately set down by Mr. Low:—"The head should be hornless, long, small, tapering towards the muzzle, and projecting horizontally forwards. The eyes should be prominent, with a great expression; whilst the ears should be thin, somewhat long, and directed backwards. The neck should be full and broad at its base, where it proceeds from the chest, but gradually tapering towards the head, and being particularly fine at the junction of the head and neck; the neck

seeming to project straight from the chest, so that there is, with the slightest possible deviation, one continued horizontal line from the rump to the poll; the breast broad and full; the shoulders, also, broad and round, and no uneven or angular formation where the shoulders join either the neck or the back; particularly no rising of the withers, or hollow behind the situation of these bones; the arm fleshy through its whole extent, and even down to the knee; the bones of the legs small, standing wide apart, no looseness of skin about them, and comparatively bare of wool; the chest and barrel at once deep and round; the ribs forming a considerable arch from the spine, so as, in some cases, and especially when the animal is in good condition, to make the apparent width of the chest even greater than the depth; the barrel ribbed home; no irregularity of line on the back or the belly, but, on the sides, the carcass very gradually diminishing in width towards the rump; the quarters long and full, and, as with the fore legs, the muscles extending down to the hock; the thighs, also, wide and full; the legs of a moderate length; the pelt, also, moderately thin, but soft and elastic, and covered with a good quantity of white wool, not so long as in some breeds, but considerably finer." Such is the Dishley, or Leicester sheep; and the breeders of the Teeswaters, of the Downs, and of the Lincolns, all claim the breeds as the source of Mr. Bakewell's improvement on the old Leicester stock. They allege that he might reduce the bone and frame by a simple dash of the favourite blood, and thus obtaining a firm superstructure, breed *in-and-in*, until it was indelible. But this, according to some authors, is very improbable. He, no doubt, however, selected those animals which corresponded with his ideas of what were the best, with light offals, and a tendency to feed, and which exhibited early maturity, and very natural forms.

"It seldom happens," says Mr. Milburn, "that one great man discovers any new fact or principle in science alone. Discoveries, according to Providential arrangements, seem to be made in different places at once. Mr. Joseph Allom, of Clifton, in Leicestershire, who rose from the plough-tail, by his mind and energy, to be an extensive farmer and breeder, was known to select and purchase choice ewes from all parts of the country, chiefly from Melton. He had a breed which were great favourites before Bakewell was heard of. Specific characteristics we cannot very easily define. Mr. Youatt slurs even Mr. Allom, in a note; and, in the text, says, 'Up to this period (the middle of last century) very little care had been bestowed in the breeding of sheep.' Mr. Marshall goes to the other extreme, and says that the origin of Bakewell's improvements are due to Allom. The truth is probably between the two. Allom's stock might be made available to Bakewell's purposes; and his practice might set the latter to work in more zealously improving the breed."

Another cause was also in operation towards the same end; and, doubtless, gave another opportunity for Bakewell's selecting his specimens to improve his breed. In 1747, there were some successions of bad seasons, which so operated on the succulent grass of Leicestershire, as to sweep off nearly the whole of the sheep on the lower clay soils of that county. This banished the more wealthy farmers from the district, and they had to take refuge on the wolds of Yorkshire, and then purchase some small-horned, fine-bred sheep, for a supply to their decimated flocks. The trade of jobbing thus commenced; and it is said that Bakewell employed the jobbers, who brought down, from time to time, these Yorkshire wold sheep, to allow him to cull the best, before they offered them to the farmers. He thus obtained compact, square, rapidly-feeding animals; and persevered, year after year, in selecting the best, in his judgment, from his own flock, until he had obtained the celebrity which has handed down his name as the greatest improver that ever lived; and the once *new* Leicester sheep has become *the Leicester* sheep; so completely has it eaten out its progenitors.

Although this breed has been intermixed with many other breeds, in almost every kind of degree, it still, in most respects, holds its ground. Breeders, however, now incline towards the production of a large animal, as being more profitable. Thus, the improved Cotswold—frequently designated the New Oxfordshire—and some of the heavier species, have

become successful rivals of the pure Dishley breed. The Leicester, however, still commands a large extent of the most fertile districts of England, and has long been introduced to Scotland, where it has been cultivated with the utmost care and success. In both countries it is chiefly restricted to the lowlands, or to land of pretty good quality. In the *Journal* of the Royal Agricultural Society of England, we find an account of the modes of management pursued in Roxburghshire, on the borders of the Tweed and the Teviot, which might be taken as the system generally adopted in the superior districts of both countries. "Before the commencement of the present century, the Cheviot were almost the only sheep found in Teviotdale and Tweeddale; whilst, within the space of thirty years afterwards, the Leicester breed, with few exceptions, had the entire possession of these districts; and they not only greatly exceeded their predecessors in numbers, but still more so in weight. On nearly all the farms of any considerable extent in breeding, a stock of these sheep is kept; and from the ewes, three successions of lambs are taken; the dams being sold off at the close of their third breeding season, or when four-and-a-half years old. In general, the whole produce of these ewes is retained upon the farm on which they are bred; a proportion of the ewe lambs, when gimmers, coming in to take the place of the old ewes sold in each year. The wedder-lambs, again, are disposed of as fat; many of them, immediately afterwards, being deprived of the first fleece; and the remainder, after being fed on turnips, in the winter or spring of the second year. Not unfrequently, however, upon farms where a large proportion of turnips cannot be raised, the whole wedder-lambs, and, sometimes, part of the ewe-lambs, are disposed of at weaning-time; and those ewe-lambs kept beyond the number required to maintain the complement of the year, are sold when gimmers, usually at about eighteen months old. These young sheep, being thus so early matured for the butcher, are maintained from their earliest time on full feed; it being a great object to prevent them losing any of the condition they generally possess when taken from the ewes. With this view, also, they are early put upon turnips, as it is very desirable they should be well acquainted with this their essential means of support, previous to any failure in the nutritious properties in the grass, or the occurrence of severe weather. To the young stock, intended to be kept for breeding, fewer turnips are commonly allowed, although they are seldom, during any part of the winter, entirely without this useful assistance. The ewes having, at this season, the range of the whole pasture, are only allowed auxiliary food during the severity of a storm, and in hard winter weather, until towards the approach of the period of lambing, when a proportion of turnips becomes indispensable to maintain them in sufficient condition to bring them well through this critical and interesting season. In general, more sheep are fattened than are bred in the district." This system, with some modifications, caused by the qualities of the land, prevails, with little difference, throughout the midland districts of England.

The Leicester, as a *turnip-feeder*, is, perhaps, the most successful of all breeds of sheep. The fat is in greater quantity, collected on the surface, than any breed whatever; and it will accumulate as much fat, if not more, for the food consumed, than any other kind of sheep. A better proof of the value of the Leicester could not be adduced, than is found in the fact of their having superseded a vast proportion of the sheep of this country, under every circumstance of pasturage and climate, and established themselves in their stead. They have also been used to improve the desirable points of almost every breed, which still at all keeps its ground. In fine, the Leicester is the only sheep which can, with any degree of success, be fattened at one year old.

THE COTSWOLD SHEEP.

Cotswold is one word produced by the union of two, and signifies a sheep-fold and a naked hill. The breed of sheep which goes by this name is both ancient and celebrated. The hills which were its original habitat are of no great elevation; but they enjoy a fragrant herbage; and though, at one time, consisting only of bleak marshes, have, in the course of years, undergone great improvement. Relative to its breed of sheep, Camden speaks of it as furnishing wool both fine and soft: whilst

Drayton writes of its abundance. Speed, writing upwards of 200 years ago, speaks of the wool as similar to the Ryeland, and rivalling that of the Iberian peninsula. Indeed, some have gone so far as to say, that the Cotswold is the progenitor of the Merino sheep, as, in 1464, Edward IV. permitted a number to be exported to Spain, where they multiplied and spread. Before this period, however, Spain enjoyed a celebrity for her wools. The Cotswold is a large breed, with a long and an abundant fleece. In the time of Queen Elizabeth, when Markham wrote, he describes them as a long-woolled race. The ewes are not only prolific, but good nurses. At one time they were bred only on the hills, and put to fatten in the valleys of the Thames and the Severn. Since the enclosure of the Cotswold hills, however, coupled with the improvement in their cultivation, they have been reared and fatted in the same district. This species has a great tendency to accumulate fat upon the back; and whilst its breast is not so wide, deep, or prominent as that of the Leicester, it is of larger bone. Its sides are flatter, but it is neither so broad nor so prominent in the shoulders and legs. The fat and flesh are laid in the back, in a large and unyielding mass; whilst the Leicester has a soft elastic firmness, in every way agreeable to be touched. This may arise from the fineness of the pelt. The Cotswold, on the contrary, has a thicker pelt, and the wool mats itself near the skin, and is more straggling at the edges. The head is white, and so are the legs; while the ears are small, and fall downwards and outwards. The top of the head is a mass of soft bushy wool. The weight of the animal will sometimes reach 28 lbs. per quarter; but 28 to 30 lbs. will be a nearer average for two-year-old sheep. At a year and a quarter they will, when properly fatted, be found to yield 19 lbs. per quarter, and sometimes attain to 20 or 21 lbs. Their yield of wool, which is fine and light in proportion to its bulk, is from 8 to 9 lbs.

The gradual infusion of Leicester blood is general amongst the most celebrated and extensive flocks of the Cotswold breed, otherwise there would be longer wool, more hardiness, less early maturity, more bone, and somewhat lighter fore quarters. The Leicester mixture, however, is not excessive, and occurs, perhaps, in a very remote degree. The sheep is still and quiet in its habits, and is one of the best kinds for carrying out the board or hurdle feeding. In Gloucestershire, the Cotswolds, now almost lost in the Leicesters, have multiplied to a degree which would hardly have been believed to be possible in this part of the kingdom; and the short-wools are nearly driven out of this district. Writing upon this breed, Mr. Spooner says, that "the superior hardihood of the improved Cotswold over the Leicester, and their adaptation to common treatment, together with the prolific nature of the ewes, and their abundance of milk, have rendered them, in many places, rivals of the New Leicester, and have obtained for them more attention to their selection and treatment, under which management still further improvement appears very probable. They have also been used in crossing other breeds, and have been mixed with the Hampshire Downs. It is, indeed, the improved Cotswold that, under the term of New or Improved Oxfordshire sheep, are so frequently the successful candidates for prizes offered for the best long-woolled sheep at some of the principal agricultural meetings or shows in the kingdom. The quality of the mutton is considered superior to that of the Leicester, the tallow being less abundant, with a larger development of muscle or flesh. We may, therefore, regard this breed as one of established reputation, and extending itself throughout every district of the kingdom."

THE DARTMOOR SHEEP.

This is one of the principal forest breeds of the West of England, and it bears a strong resemblance to the Dorset. Its habitat is found in the higher situations of Devonshire and Cornwall; and, from the hardiness of its nature, it is well adapted to the poverty of the pasture which the forests of Dartmoor and Exmoor afford. They have white faces and legs; have horns generally; but some are without these. The head and neck are small, and so is the bone in every part of the animal; whilst the carcass is narrow, and the sides are flat. When fat, they weigh from nine to twelve pounds per quarter. In the yolk, the place is three or four pounds in weight, and the wool is somewhat short, with a coarse top. It is

classed, by some writers, among the middle-woolled breeds; but, in our classification, we have followed McCulloch, and made only two distinctions—namely, a long and a short, for the sake of simplicity. Large numbers of them browse on the hills and the commons of the heathy parts of Devonshire; but the ewes are taken into inclosures to lamb. For the sake of their wool, the wethers are kept on the downs, until they are five or six, or even eight or ten years old, save when the winters are severe, when they are inclosed to prevent their being lost in the snow. Their mutton is delicate, and, in the metropolis, procures a ready customer. Their wool, however, is not very fine. Indeed, from an early period, the Devonshire produce of this article has had but an indifferent character. In a note in the work published in the *Library of Useful Knowledge*, it is stated to have been inferior even in the days of Edward IV., when the Devon manufacturers petitioned him to permit them to mingle flocks with their wool, in the making of their serge cloths, because the material was so gross and stubborn, that cloth could not be made thereof, without mixing it with flocks. Since the introduction of the Leicesters, however, a better article has been produced. It is mostly used for the manufacture of livery-cloths.

THE EXMOOR SHEEP.

This species is very like the Dartmoor as to conformation and character, but it is of a still smaller size. The males have hair under the chin, like goats, and bear a striking resemblance to these nimble-footed animals in their activity and boldness. They are milder than the Dartmoor breed, and their flesh is equally good. The horns are large, and very peculiar, spreading at the roots so much, as nearly to touch each other, and proceeding backwards, and growing outwards, so as to be somewhat spiral. The little ears peer out of these folds, and a dull, heavy-looking head is situated between. The throat is flabby and hairy; the breast narrow and thin, sinking backwards, almost behind the fore legs; and the fore quarter is short. There is a falling of the back behind the shoulder, and a rise at the rump. They are now much improved by the infusion of a little Leicester blood. They are the sheep of Cornwall, which, in early times, were remarkably small, and their fleeces so coarse, that the wool bore no better title than that of Cornish hair. Under that name, the cloth made of Cornish wool, was allowed to be exported without being subject to the customary duty paid for woollen cloth. When cultivation began to extend, and the cattle to improve in size and quality, the Cornish had the same poundage conferred on them by grant from Edward the Black Prince, the first Duke of Cornwall, on condition of their paying 4*s.* for every hundredweight. These sheep principally occupy the heaths and downs of every part of the county, even as far as the sandy hills, which hardly have a covering of green towards the Land's-end. We have seen many of them cropping their scanty herbage in these parts, where they are highly valued, on account of the peculiar flavour which their mutton has, from the numerous aromatic plants with which this part of England abounds. The native breed is considered to have reached its maturity at four years old; and the average number of twin lambs produced, is about one in six.

THE BAMBOROUGH SHEEP.

This is both a short and long-woolled race, very peculiar and valuable, says Mr. Milburn; and yet it is scarcely named by half the writers on sheep. It makes mutton readily, and produces a valuable wool. It is bred in the south-eastern parts of Northumberland, and north of Durham—in fact, from the Tweed to the Tyne—and the regular fair for their purchase is Rodbury. The flocks are remarkably like each other, having flat level backs, being good grazers, producing 6 lbs. of wool of a strong but close quality, and weighing 22 lbs. per quarter when fat. The heads are placed horizontally, and the animals rapidly accumulate fat. With ordinary keep the ewes are always fat. They are excellent feeders, and consume a great deal of food. The fat is laid on internally to a large extent, but it is duly mixed with the muscle; and consequently the mutton is somewhat insipid. In feeding, they grow more fat and less muscle, perhaps, than any other breed. From their great resemblance to each other, they seem to be a distinct breed, and are a good deal grazed, the ewes being purchased for lambing in Yorkshire. After the lambs are weaned, the ewes soon become fat

on grass in summer, and the lambs rapidly feed for the butcher.

THE BERKSHIRE SHEEP.

About the centre of Berkshire, its old breed was wont to be found, with their Roman noses, black faces, long tails, and black and mottled legs. Some of them were polled, but most of them were horned. Their strength, activity, and height were considerable; whilst they folded well, and, when fattened, assumed large proportions; but to bring them to this condition usually took a long time. Mr. Herbert says, that "they were next in weight to the old Leicester breeds, but higher than them on the legs. The wethers, when moderately fat, weighed from ten to thirteen stones; and when fattened for prize show, they weighed from sixteen to twenty-two stones." This breed was first improved by a cross with the Wiltshires, and subsequently with the Southdowns, which are now the prevailing breed in the county. The blood of the old race may be said to have become so deeply amalgamated with the Southdowns, that they have lost their original character.

THE BLACK-FACED, OR HEATH SHEEP.

This peculiar breed of sheep inhabits the lofty, but barren and heathy hills which, commencing in Derbyshire in the south, run thence into Scotland, through Lancashire, Yorkshire, Cumberland, and Westmoreland. It is questionable whether they are the aboriginal breed of these districts; but whether they are or not, they have extended themselves into the mountains of the Highlands, and even penetrated to the Orkneys and Zetland, where they have taken the place of the original and more inferior breeds of these parts. They are celebrated for the excellence of their mutton, but their wool does not rank so high. There is no doubt, however, that a breed of sheep producing wool of a superior kind to that now yielded by the black-faced sheep, was at one period common in Scotland. Hector Boethius, who wrote about the year 1460, speaks of the fineness of the wool produced in various parts of this county. Remarking on the sheep which inhabited the vale of Esk, where, until the introduction of the Cheviots, the rough-woolled, black-faced sheep alone were found, he says, as given by Hollinshed—"Whose sheep have such white, fine, and excellent wool, as the like of it is hardly to be found again in the whole island." Sebastian Munster, in his *Cosmographia Universalis*, published ninety years afterwards, says—"The sheep pasture in each country (England and Scotland) is such, that nowhere is there better or finer wool." Dr. Anderson proves, that three or four centuries ago, a fine-woolled breed of sheep was common in Scotland. In Galloway, Annandale, and Niddesdale, it was found in the greatest numbers; but it remained longest in some of the mountainous districts of Aberdeenshire. Not a century ago it existed in Fifeshire; and if any of it now remains, it is perhaps in the islands of Shetland.

Returning to the black-faced sheep, however, we find it observed by Mr. Torr, that it is a breed which possesses characters that distinguish it from every other species in the British Isles. It belongs to the smaller races of sheep in regard to the weight to which it attains; but is not only larger, but more robust than the Zetland, the Welsh, and the ancient soft-woolled sheep, which it displaced. It resembles the Wallachian, which has an affinity with the Persian; and, like it, a conjecture might be ventured that it came originally from the East. Its peculiarity is its extreme hardiness, as it will subsist where many other races would literally starve. It is left to shift for itself amongst the heather and furze; and, when unmolested, wanders almost wild among the hills, picking up such herbage as it finds suitable or agreeable to its palate. Thus it is reared at very little expense, until it is transferred to richer pasture, or till turnips are given it, with the view of its being fattened for the butcher.

The face and neck of these sheep are usually black, though sometimes they approach to grey; and, a little before shearing-time, become brown. Elegant and graceful horns grow from each side of their heads, and usually bend backwards and downwards. The specimens on the heads of some four-year-old wethers, have been pronounced really beautiful. The head is broad, and the back straight and broad; the chest deep, and the legs straight and fleshy. The wool is long and pendulous, and

considerably curled. The eyes are full, and expressive of *life:* whilst the carcass is round-barrelled, with well-arched ribs. The lines down the hams and the breast are straight and perpendicular. The neck is fine and clean. The lean Highland sheep are usually bought at Falkirk trysts, where myriads of animals cover the moor. As many as 80,000, and even 90,000, are sometimes exhibited at the October tryst. Twenty thousand is a common number at the other trysts. About half this number are wethers of the shear; the remainder are two-year-olds, for further picking on the moors, and for store or for feeding, and a few rams. The year-old wethers are either purchased there to fatten, or are run on in winter in any low pasture with rough grass, and fattened in the summer of the following year on grass. During the winter these will subsist, and even improve, on very inferior grass; such, indeed, as almost every other animal will refuse; and if they are not crowded on the ground, they will manage to get through the winter. Many persons imagine, that it takes four, or even five years, before the full mutton-development of the black-faced sheep takes place; but this is not the case. Heather-fed sheep, fed in the second winter after they are lambed, are, when rapidly fatted, in as good condition as they can be at any subsequent period. "This breed," observes Professor Low, "does not appear to amalgamate well with other races, so that crossing has not generally been successful as a means of permanent improvement. It has been frequently crossed by the Cheviot, but the descendants have been found inferior in weight, form, and quality of wool, to the pure Cheviots, and to the black-faced heath breed in hardiness and aptitude to thrive in an upland country of heaths. But as it is not always deemed safe to change a stock of sheep, habituated to their locality, the practice of a continued crossing with the Cheviot, until the flock has acquired the characters of the latter, has been sometimes adopted; so that the original black-faced stock has become, in time, almost Cheviot. Another species of crossing has become remarkably successful—namely, the employing of males of the Leicester or Southdown for a first cross. The lambs—the result of this mixture—are excellent, rising to a much greater weight than those of the pure black-faced blood. Of these crosses, the best has been found to be with the Leicesters. That with the Southdowns produces very handsome sheep, having perfectly black faces and legs, and a close good fleece; but they scarcely attain the size of the Leicester crosses; and the latter, accordingly, are preferred for the special purpose for which this species of breeding is designed."

To keep black-faces properly, or well, they should not be crowded, or too much overstocked. They are capable of bearing very hard treatment; will stand almost any degree of cold, and any quantity of wet, whilst supporting themselves on the poorest of pasture; but they are seldom tried with this; therefore, age has to make up for previous neglect; and they must be kept longer than any other kind of sheep, to bring them into suitable condition.

Heavy stocking will, nearly always, make the difference between good and bad produce; as it will diminish the size of the sheep, throw it back in its feeding, and the breeder and the feeder will be a much greater time in bringing up their produce to that condition which may be called ready for the market.

CHAPTER III.

SHORT OR MIDDLE-WOOLLED BREEDS OF SHEEP.

THE DORSETSHIRE SHEEP.

WHAT some designate the middle-woolled sheep, comprise the Dorset, the Southdown, the Norfolk, the Suffolk, and Cheviot breeds, with some others, which were all formerly short-woolled. For the sake of simplicity, we

have retained their original distinction, as their wool has been lengthened only by the improvements made in breeding. The Dorsetshire sheep is a breed of itself, although it is now greatly encroached upon by the Southdowns. It is a valuable breed; and where pure, is entirely white, with a long and broad face, and with a tuft of wool on the forehead. The shoulders are broad and low; the chest deep; the back straight; the loins broad; the legs somewhat long, and the bone small. They are a hardy and useful race, folding well, and yielding excellently flavoured mutton. When three years old, they average from 16 to 20 lbs. per quarter. "The great peculiarity of the Dorset sheep," says Mr. Milburn, "appears to be, that while other breeds receive the ram only at one and the same season, the Dorset will take him all the year round, and even while the lambs are suckling. There is thus the power of supplying lamb at any season of the year for the pampered appetite of the epicure; and vast sums are thus realised by those who keep them for the purpose. Nor is this peculiarity one which at all applies, as might be supposed, to the mild climate, or favoured pasturage, of Dorsetshire. The breed possesses the same peculiarity in all parts of the country, even in Scotland; though it must be obvious, that the rearing of lambs at the period of midwinter, is far more likely to proceed favourably in the mild and genial south-west of England, than in the colder and more northern climes. The ewes take the ram in May, so that they will produce in October; and the early lamb at Christmas, in London, is obtained from this late produce." These lambs are house-fed—a practice which is not now so common as it used to be; but the manner in which it was, and still is, partially pursued, in the districts near the metropolis, has been thus described by Mr. Middleton. He says, that "the ewes are always, without exception, of the Dorsetshire breed, and the early lambing species are sought for, throughout the country, with great diligence; for it is thought that not more than one in three will lamb sufficiently early for the purpose. Those of large size, with white noses, are most in esteem; and anything like black on that part would occasion their being rejected. The colour of the flesh of those lambs, when butchered, is, also, a matter which, in a great measure, governs their value; and, therefore, those which can be warranted to die *fair* always bear the highest price. This, evidently, cannot be guaranteed when produced by ewes which have been promiscuously purchased at the fairs; those breeders with whom the sucklers usually deal, are, consequently, careful in the selection of the rams, the issue of which is said to be known by certain marks in the mouth, even before any previous knowledge of their progeny. The rams and ewes should be put together at such a time that the lambs may fall at the proper season—say, somewhere about Michaelmas—from which period there is usually a succession of them, until towards Christmas. The ewes, both some time previously to this, and during the whole period of suckling, are kept in a croft, adjoining the lamb-house, and must be well-fed, in addition to after-grass, cole, cabbage, or any succulent roots which may be in season, together with brewers' grains, pollard, ground oats, or barley-meal, pea-meal, and linseed, or, in short, any food which will best promote an abundance of milk, and the consequent growth of fat in the lambs. The lambs are separated from their dams, and put into the house, which should be well-littered with clean wheat straw, a little of which should also be placed in racks, with the ears downwards, in order to amuse themselves, and prevent them from gnawing each other's wool. Some chalk, baked in an oven, should likewise be put in the troughs, both in lumps and powder, in order to guard them, as much as possible, against looseness; and the most scrupulous attention should be paid to cleanliness, as they do not leave the house until sent to the butcher. To prevent them from playing, and thus insure quiet, light is excluded from the house, until partially admitted at such times when the dams are brought to suckle them, which, in most cases, is three, or even four, times in the day. If the house, however, be large enough to admit of the ewes being allowed to remain with them during the night, the usual plan is to admit them at sun-down, and turn them into the pasture soon after the dawn of day; in which case, they should be again brought to them about noon. The lamb-house is, however, generally too hot; and this successive change from hot to cold is so very injurious

to the ewes, that it is no uncommon thing for a ewe or two to die in the night. When the ewe is capable of supplying as much milk as the lamb will consume, such as have lost their own, or which have been sold early, are brought in and held by the head, or put into a yoke, till the lambs, by turns, suck them dry. They are then turned into the pasture, and, at twelve o'clock, the dams are driven into the lamb-house for an hour, in the course of which time each lamb is suckled by its mother. At four o'clock, all the dam-ewes—as those which have not lambs of their own are called —are again brought to the lamb-house, and held for the lambs to suck; and the mothers of the lambs are afterwards brought to them for the night. Lambs thus treated, and kept free from all disturbance, will, in about eight weeks' time, become sufficiently fat, and their flesh extremely white and delicate." Should a lamb die, the ewe is still retained to milk the rest in turn; and stands are made with stocks, into which she is fastened until her udder is thoroughly drained. This is done previous to each lamb being allowed to suck its own mother; and thus the loss of a few lambs is not so much felt, as the whole stock then derives a larger proportion of the fattening milk. The price at which the lambs are sold will vary; but sometimes they produce as much as £3; though £2 is possibly nearer the average, which is a large sum for the care, and short period of time (about eight weeks) which they take to be fattened. When *grass lamb* is to be produced, the ewes are put to the ram at a later period, so as to have the offspring dropped about March, and they are only partially provided with shelter. The ewes are kept in the same liberal manner; but the lambs have more liberty, and are much less trouble to their owners. Ten or twelve days after lambing, whilst being fed on such nutritious food, they will again often admit the ram, and thus will bear lambs twice in the year. Such as are house-fed, have by far the best chance of successful breeding, as the second time of producing the grass-fed lamb would be at an inconvenient portion of the year, and the young would be likely to suffer damage from flies, and other insects, from the restlessness which these little torments cause them at this early period of their lives.

THE WILTSHIRE SHEEP.

The old race of Wiltshire sheep formerly extended over the greater portion of the county, but they may now be said to be extinct. The present race is the largest of the fine wool-bearing animals; and what it produces is extremely fine, and weighs 2½ lbs. per fleece. It is described by Mr. Milburn as having horns rising near each other, and bending backwards and downwards, close to the head of the animal. The hair on the face and legs is perfectly white. The bones are large; and, although the animal, comparatively speaking, makes little flesh, it eats voraciously. The belly is destitute of wool; the head is long; the nose somewhat arched; and the nostrils open, wide, and prominent. The fore quarters, especially the breast and shoulders, are light; and there is a considerable dewlap. The hind quarters are better developed, and the saddles and legs very good. The back is black in the middle, and the shoulder-points project upwards. On the whole, it is a clumsy sheep, and is only preserved in an unimproved and native form on a family farm near Hendon, where the stock is kept pure, under the provisions of a will, which permits the farm to be held on this special condition. The old Wiltshires were, to a certain extent, improved by selection of the smaller, the better formed, and the more generous feeders among the native breed; but they were chiefly indebted to the Southdowns, by which they were crossed again and again, until almost every trace of the old breed had been eradicated, and a useful variety of the Southdown took its place. This variety was distinguished from the true Sussex sheep by being of a larger size, having a lighter and finer fleece, and being of a lighter colour.

THE SOUTHDOWN SHEEP.

This sheep is, in England, what the black-faced sheep is in Scotland, being, as a mutton-producer, held in the highest esteem, especially for the tables of the rich. Nor can there be mentioned a breed which has undergone more improvement than these beautiful sheep. The advancement of the old short-woolled sheep into a middle-woolled race, is an advantage in

every sense, particularly as the short wool, used exclusively in the manufacture of fine cloths, is abundantly supplied by foreign "growers." Of this race, one of the first is the improved Southdown breed, depasturing on the long range of chalky hills extending from the sea-coast of the Isle of Thanet, and the cliffs of Dover, through Kent and Sussex. Formerly this breed, as Mr. Ellman states, in the *Library of Agricultural Knowledge*, was a small size, far from possessing a good shape, and late before they were capable of being fattened; now, however, they are greatly improved, both in shape and constitution. "They are smaller in bone, equally hard, with a greater disposition to fatten, and much heavier in carcass when fat. They used seldom to fatten till they were four years old; but it would be a rare sight to see a pen of Southdown wethers at market more than two years old, and many are killed before they reach that age." The Southdown sheep is, in fact, the model of what a hill sheep ought to be, and the flesh, in fineness of grain and flavour, is peculiarly excellent. The wool is of a very useful quality, but is both larger in fibre, and less numerously serrated, than the short Saxony, and does not, therefore, possess such a felting power; hence it is rarely used in the manufacture of fine broad-cloths. Still, from its fineness and felting powers, compared with the wool of many other middle-woolled breeds, it is highly esteemed; and for flannels and worsted goods in general, is extensively employed.

In describing it, the hair on its face is black or brown, even, short, and fine. The wool is short, close, and remarkably fine in texture and quality. It lies thick over the whole body, and has, when touched, a feeling of great softness, accompanied with a high degree of elasticity. The top of the head is free from wool, and the countenance is fine and placid; the eye is full and expressive, yet mild and gentle, and somewhat prominent. The ears are small, and fall backward and a little upward. The legs are short, especially from the knees to the feet. The breast is full, round, and moderately wide; the neck thick and short, but free from loose fleshy skin. The top of the back is straight and flattish, but not remarkably broad; whilst the belly is nearly straight, but a little tucked in behind the shoulders. The wool is remarkably fine, and is the only kind of English material altogether suitable for the finer class of cloths. The breed is without horns, and comparatively hardy, occupying the downs of Dorset, and now gradually extending into Norfolk, Yorkshire, Hampshire, Kent, &c. In the London market, where their mutton is considered superior to all other kinds, they are in great request. This is the improved Southdown; but the older breeds were low, and light in the fore quarters, although they were backed with good saddles and legs. The improvements have not been effected by crossing from other breeds, but from selecting the best, and breeding carefully from them; and while the symmetry and points of the animal have been so much improved, the quality and grain of the mutton, the equal distribution of fat and lean, the marblings of the flesh, and the internal fulness of tallow, have all been fully sustained. An earlier maturity in the breed has been attained, and the fattening process has progressed. The wool is longer, being about four inches, though not yet long enough for combing. The fleece usually weighs from 2½ to 3 lbs.; and the average weight of the carcass may be taken at 18 lbs., though the improved breed will often weigh from 20 to 23 lbs. per quarter. Mr. Ellman, of Glynde, was the great improver of this breed. Two of his rams were bought by the emperor of Russia, to try the effect of a cross on the Northern sheep. This honour was appreciated by Mr. Ellman, who requested the Duke of Bedford to put a price on them, as he did not wish to charge a sovereign a greater price than any one else. The duke accordingly fixed the price of the two at 300 guineas, and purchased a pair for himself at the same rate. In order to thrive well, and *grow* in mutton, the breed requires a dry, chalky limestone, or gravelly soil, with fine short herbage. The ewes are prolific, two bearing twins to one being single; and the draft ewes are usually sold off, at four years old, to feed in the turnip districts of Norfolk and Suffolk. The care of the sheep is nowhere better understood than in Sussex, where they are housed and sheltered in severe weather, at and near the lambing season. When the lambs are a-foot, they are

well provided with shelter, and their dams with nourishing food. The Southdown is a sheep remarkably free from disease, especially the sturdy and the rot.

THE NORFOLK SHEEP.

This breed was formerly extensively diffused throughout the uplands of Norfolk, Suffolk, and Cambridgeshire; but it is now fast disappearing before the Leicesters and the Southdowns. They are a hardy race, and have a striking resemblance to the black-faced, or heath sheep, being similarly marked in the face and legs, with long, spiral horns, large bones, long bodies, flat sides, high backs, narrow loins, and light and somewhat short wool. The mutton, however, is of rich flavour, such as is usually found to be the characteristic of all wild and semi-wild animals. They are of a wild and roving disposition, and will leap over the ordinary fences; and their long continuance in the county is probably one reason for the somewhat elevated embankments on which the fences are generally planted. Owing to this disposition they are now mostly fed on the large open heaths, which, strange to say, are still prevalent in Norfolk, notwithstanding its fine climate, and general capability of improvement. When fatted they are usually folded, and will weigh from 16 to 20 lbs. per quarter; will fatten at two years old, and are famous travellers.

The principal value of the breed, however, is in their haunches of mutton, and their deer-like, graceful heads and horns. The mutton, when long kept, perhaps more closely resembles venison than the flesh of any other breed. The horns are nine or ten inches in circumference at the base, and as much as thirty-six inches long. Lord Leicester, if not the first, greatly helped to effect a change in this breed. "When he found that the Norfolk sheep," says Lord Spencer, "were a very unprofitable sort, the same reasons induced him to try the New Leicester breed, a variety of sheep probably as ill calculated to succeed on such a soil as the one he occupied, as any breed which he could have selected. He, at last, found that the very best sort of sheep he could adopt were the Southdowns. In this, however, as in every other of his farming experiments, Lord Leicester acted with great caution, and did not make the changes which he contemplated, till thoroughly convinced by practical experience that they would answer. Accordingly, for several years he had upon his farm, at the same time, Norfolk sheep, New Leicester, and Southdowns; he also tried the Merinos, but he did not persevere long with them." Subsequently, this celebrated agriculturist kept no other sheep but Southdowns. The Norfolk breed were speedily abandoned by the neighbouring farmers; and in a very short time, from Lynn to Holkham, there was not such an animal as a Norfolk sheep to be seen. The Southdowns entirely superseded them.

THE CHEVIOT SHEEP.

The Cheviot breed is very distinct from the common mountain, or black-faced race, with which it is, on all sides, immediately surrounded, these two races dividing the north between them. The Cheviot is hornless, and the general contour is excellent; the shoulders become full, the body round and long, and the limbs small-boned. The mutton is in great esteem; and the wethers average 16, 18, or 20 lbs. weight per quarter. It appears from the testimony of practical farmers, that the attention paid to the improvement of this breed, in reference to the condition of the carcass, has been followed by a deterioration in the quality of the wool, which is said to have been formerly capable of entering into the manufacture of fine cloths. Still, however, the wool is good, though inferior to that of the Southdowns. It far surpasses that of the black-faced breed; and as the Cheviot race is equally hardy, and as capable of sustaining cold as the former, and is content with the alpine plants of the bleak hills and mountains, it must be expected to supersede the black-faced breed, as it has already done in the forest of Ettrick and the whole of Selkirkshire, and even Sutherland. The foreknowledge which these sheep possess of approaching storms, and the assiduity with which, while the shepherd dreams of no impending evil, they will seek a place of shelter and security, are curious traits in their character. It is thus that they often warn the shepherd, by the display of this instinct, wisely implanted within them, and lead him to add his precautions to those which they

have themselves adopted. In spite, however, of the vigilance of the shepherd and the instinct of the sheep, many of them often perish beneath towering snow-drifts, and sometimes whole flocks are lost. It often happens, that when sufficient shelter cannot be obtained, the flock crowd together for the purpose of mutual warmth, and are soon covered with the snow. If this does not occur, the lambs, unable to endure the severity of the storm, perish; and the mothers, bewildered, wander about seeking their offspring, till they themselves sink exhausted with their efforts and distress. With but little food, sheep can remain for many days buried beneath the snow; but where this cannot be obtained, the period of endurance is proportioned to the strength of the animal's constitution and the intensity of the cold. One winter, a sheep, near Kendal, was buried in the snow for thirty-three days and nights, without the possibility of moving, and yet survived; and a sheep in Cumberland was buried for thirty-eight days. When extricated, it was found to have eaten the wool off both its shoulders, and its frame was reduced almost to a skeleton. By due attention, however, it gradually recovered. The Cheviot has a white face and legs, somewhat resembling the cover of the hills during the greater period of winter; but the grand characteristic of the Cheviot flocks is their extraordinary likeness to each other, how many soever there may be. Their imperfection is a narrowness of the back, ribs, and shoulders, from which arises their incapability of carrying a large accumulation of mutton. Judges, therefore, *choose those with broad faces*, because this, they think, is indicative of a large bony development. In selecting lambs, or even sheep for fattening, the hand of the grazier grasps the back-bone, over the kidneys, and forms his judgment by its broadness, whether it be sufficiently capacious to carry the complement of flesh and fat which he calculates should be put upon it. The eyes of the Cheviot are small, prominent, and lively. The body is long; the fore quarters somewhat light; the legs clean, and small turned; the feet thin; the wool close and fine, but neither so soft nor so elastic as that of the Southdown. It is also too thick for combing. The improvements in the sheep have added a little to the breast and shoulders, without diminishing the feeding qualities, or injuring the wool. The neck and shoulders are fuller. The breast has assumed greater prominency, but is still narrow. The back retains its narrowness; but the fall behind the shoulders, common in the old breeds, has been removed. The ribs are flatter than either the Southdown or the Highland. The animal combines fat with muscle, and is, when well brought up, covered internally with tallow. They are remarkably hardy animals, and live on very poor and stunted food growing on the mountains of Northumberland. Their hardiness has induced many of the Scotch farmers and breeders to locate them on the Scottish mountains, where, even on the hills of Sutherlandshire, they are to be found successfully bred and thriving. They have also an extensive range on the Yorkshire hills.

The Cheviot hills form a part of that extensive and lofty range which, commencing in Galloway, runs through Northumberland, into Cumberland and Westmoreland, to the extent of from 150 to 200 miles. The majority of their summits end in points, and form terminations to a series of conically-shaped mountains. The sides of these are covered with smooth, short herbage, and have a considerable degree of steepness; whilst, at their bases, they nearly join each other. With the exception of the summits the soil is fertile. On these hills the Cheviot mutton is reared, celebrated for its tenderness, sweetness, and delicacy. The sheep are now sometimes fatted at one year old; and the flesh, in appearance, has, when well kept, a striking resemblance to the Welsh mutton; but it is more tender, and not so high in flavour. The bags will weigh 14 lbs. or 15 lbs. per quarter; and the two shear-wethers will sometimes weigh as much as 22 lbs. Instances are mentioned where they have been brought to weigh 25 lbs. per quarter; but these are extreme cases. The improvements of this breed have chiefly been effected by a mixture of the Leicester blood. This has been done with great caution, as the Leicester is a tender and delicate sheep, not well adapted to cold regions, such as the snow-clad moors of Northumberland, of Westmoreland, and of Scotland. While a single dash of Leicester, however, improves the frame, lengthens the wool, and increases the

feeding tendencies, it is not so severe (if the impression be carried rapidly back to the Cheviot race) as to weaken materially the vital power of the animals. The period, when Cheviot and black-faced sheep should be selected for breeding and rearing on mountain pasture, is given by Mr. Milburn :—When the produce of the hills is simply black furze, or heather, the black-faced Highland sheep will be preferable. When the grass is green, though ever so poor, the Cheviot will yield a greater amount of profit. The following, taking this principle, will be about the comparative merits of the two breeds :—

Black-faced.	Cheviot.
Wool inferior . . .	Wool superior.
Mutton superior .	Mutton inferior.
Hardiness equal . .	Hardiness equal.
Maturity later . . .	Maturity earlier.
Feeding less rapid . .	Feeding more rapid.
Less mutton	More mutton.

The balance, on the whole, on suitable lands, seems to be decidedly in favour of the Cheviots.

THE RYELAND SHEEP.

This sheep is another old, if not original, breed, and takes its name from a district in the southern part of Herefordshire, where a large quantity of rye used to be grown, and where many of this kind of sheep were reared. It is a small breed, rarely exceeding more than fourteen or fifteen pounds the quarter in the wether, or from ten to thirteen pounds in the ewe. Its wool is white, and covers the sides of the face, coming over the top of the head in a bushy tuft. It is in great favour for *carding;* superior, indeed, for this purpose, to all other kinds of British wool, and almost rivals the Australian. It is, therefore, put down as essentially a wool-producing animal. As the desire for mutton began to extend in the country, and improved turnips, cultivated in the light lands, enabled farmers to produce more of that material, the breeding of the true Ryeland sheep somewhat declined. So far back as 1343, it was noted for its wool; but even then it does not seem to have been considered the most valuable of the British fleeces. The Shropshire, Staffordshire, and Oxfordshire, were all sold at a higher price than the Ryeland. "It is difficult to account for this inferiority," says a writer on the Sheep, in the *Library of Useful Knowledge*, "at that time; for our earliest writers on the sheep, speak of the Ryelands as standing at the head of the short-woolled breeds. If, however, the opinion of Mr. Herbert be correct, some light is cast on the subject. He believes that the Ryelands, almost exclusively, in early times of sheep-husbandry, extended longitudinally through those districts, from the Thames to the Tyne; and the Cotswolds were produced by a cross between the Ryelands and some heavy sheep. The Herefordshire, Shropshire, Staffordshire, and Oxfordshire wools, spoken of in this record, were only varieties of the Ryeland, and of which the Herefordshire happened at the time to be the worst. In the course of years, however, the Ryelands were gradually displaced by a heavier sheep over the greater part of the other counties, but continued to be cultivated in a portion of Herefordshire." Formerly these sheep were taken great care of, and regularly housed at nights—a practice which, no doubt, arose with the view of preserving the sheep from the inclemency of the weather, as well as of improving the quality of the wool. The race is small, but it attains an early maturity. The head and face, from being covered with wool, have a large and heavy appearance, compared with the short leg and compact carcass of the animal. The ears are somewhat thick and erect; the chest deep, but not broad; the barrel round, but the back by no means flat. The fat of the animal accumulates mainly on the rump and tail, but not to such an extent as to interfere with its activity. It is extremely hardy, and is supposed to be capable of living on less food than any English breed; but requires it to be of a fine quality. Like all the old races of sheep, it has a tendency to accumulate fat internally.

To improve the Ryeland, the principal object has been to assist the development of fine wool by crosses with the Merinos. Years ago, Dr. Parry, of Bath, M.D., stimulated by the venerable Bath and West of England Agricultural Society, crossed the ewes with the Merino; and the first cross was most successful. The fleece was increased one pound per animal; the texture was finer; and the carcass was considerably enlarged; while the flavour of the mutton was said not to be deteriorated.

The wool, indeed, was pronounced as fine as the pure Merino. But an error was committed by interbreeding with the crosses themselves; hence, in three or four generations, they fell off so much, that the Anglo-wool became so inferior as to be nearly unsaleable. Having once crossed, they ought to have carried back the cross to the one pure breed or the other; or, what would have been, perhaps, better, they should have kept a stock with which to cross, and thus have preserved a fresh and continuous breed of newly-crossed animals. Attempts to improve the size of the sheep have been made by crosses with the Leicesters, Cotswolds, and Southdowns; the results of which were the destruction of all the peculiarly desirable properties of the Ryeland, as well as the obliteration of several of the others. The breed has therefore been abandoned for more profitable mutton-producing kinds of sheep.

THE SHROPSHIRE SHEEP.

In the centre and north-western districts of Shropshire sheep predominate; the north being principally devoted to the dairying of cows, and the breeding of cattle generally. Formerly, there were several varieties of sheep in this county, but modern times have brought them to a greater equality of character. The old Shropshire sheep had black or mottled faces and legs, and were horned. They were about the size of the Southdowns, but the neck had greater length, and the carcass was not so compact. They inhabited a rye-producing district, probably the Morfe-down, consisting of about 4,000 acres of common land, near the Severn, which yielded a short and stunted, but fine grass. The fleece is about the same weight as that of the Ryeland—2 lbs.; but the staple is particularly fine. They are seldom kept till more than five years old; and the ewes will not weigh more, when fat, than 9 or 10 lbs. per quarter. The wethers will weigh 13 or 14 lbs. Modern tastes and habits, however, will not allow of sheep being kept for 2 lbs. of wool, and 40 lbs. of mutton; and hence the altered demands and wants of the population are fast banishing all these original breeds. The Cotswolds and Leicesters having been introduced into Shropshire, both pure, and in various crosses with each other, they have changed the character of every short-woolled sheep. The Shropshire short wool, however, was, at a former period of our history, held in very great estimation. The author of a work on the commercial policy of the times, in 1694, speaks thus of it:—"It is no small advantage to trade, to be fitted with a complete assortment of goods, abounding in the middle sorts of wool, excellent of its kind, and suitable to a middle sort of people, which are far the greater number; and herein chiefly is our strength: not that we, in the least, fall short in the merits of our fine wool; our Herefordshire and our Shropshire wool is not to be equalled, in its kind, by any part of the world, and suitable to almost any degree."

THE WELSH SHEEP.

This is held as the most excellent of all the mutton-producing race, owing to its flesh being so highly-favoured, and so fine in the grain. They are the very converse of the Lincolnshires, and are a truly Lilliputian breed. They are the most remunerative of any kind of mutton sold in the London market, and are thus described by Mr. Milburn:—"The two haunches are usually cooked together, undivided, and present a most uncommon appearance. The wethers are killed at four or five years of age, and will then weigh, when fat, only 8 or 9 lbs. per quarter. The ewes usually weigh 2, or even 3 lbs. per quarter less. The sheep, when alive, is a goat-like animal, somewhat resembling the gazelle of the Nimrod sculptures. The ram has two crumpled horns, rising upwards, and falling backwards again to the neck. The ewes are usually hornless. The neck is long; the shoulders high and thin; the breast small, narrow, and backward; the legs and loins full and broad. The ribs are flattish, and the belly a little depressed; the tail long, and bushy towards the extremity, nearly down to the middle of the hind legs. The bones are remarkably small. They are the most active and sure-footed race of sheep we know. They are essentially wild in their habits, and clip about 2 lbs. of somewhat fine wool. The ewes are sometimes milked by the Welsh farmers; but this pulls them down, and is very injurious to them. Some persons clip them twice; that is to say, they shear them at the usual time in June, and again take off part of the wool from the fore quarters in the month

of October, alleging that they are less liable to have it torn off by the furze and briars, and more able to forage for their daily supply of scanty herbage amongst the bushes in winter."

THE HERDWICK SHEEP.

This is the most valuable sheep on the mountains of Cumberland and Westmoreland; and their origin is thus given by an admirable writer on the sheep. In the beginning of the last century a ship was stranded on the coast of Cumberland, and had on board some Scotch sheep, which seem to be now unknown in that country. They were got on shore; and being driven up the country, were purchased by some farmers, who lived at Wasdale-head, in the neighbourhood of Keswick. They were small, active, polled, and their faces and legs speckled, having a great proportion of white, with a few black spots strewed upon it. They were turned, at once, upon the neighbouring hills. They had not been long there before they evinced a peculiar sagacity in foreseeing the approach of a snow-storm; for, a little before its coming, they clustered together on the most exposed side of the mountain, and where the violence of the wind usually prevented the snow from lodging. This instinct caused them to be regarded with a degree of interest, and almost of superstition; and their excellent qualities and adaptation to their new situation, became speedily evident. Their fleece was considerably finer than that of the common black sheep, and the matted quality of the wool enabled them to endure any severity of weather, and even to pass the whole of the winter without the smallest quantity of hay being expended upon them. They were continually moving about, and, therefore, rarely or ever overwhelmed by the snow; and, by their ceaseless activity, they scraped away the snow, however deeply the herbage might be buried under it. The ewes weigh from six to eight pounds per quarter, and the wethers about eleven. The wethers are slaughtered at four or five years old, and seem not only to thrive best on their native pastures, but, when the ewes are driven away, they will invariably return at lambing-time to their old quarters, however distant they may be. This shows a remarkably wild instinct, and is of the same character as that of the black-faced Highland sheep—flocks of which will sometimes actually swim across the Firth of Forth to find their way to their native mountains.

The ewes breed for fifteen or twenty years, and are always kept as long as they will continue to do so; the sales being made of the fatted wethers. When killed at home, the legs are usually cured and dried; and it is jocosely said that the inhabitants of these uplands never eat mutton but when they find a fallen sheep, which, when they do, they shake by the leg, and if it drops to pieces it is rejected; but if not, it is carried home, dressed, and eaten. Their flesh has a strong game kind of flavour, much relished by the epicures of large towns. The animal is said to have fourteen instead of thirteen ribs, which is the number possessed by all other species.

Having thus specified some of the more important of the middle-woolled breeds of sheep in our island, most of them, or all, derived from the old short-woolled breeds by a system of judicious management, we have now to state that the middle-wool varies in different breeds, in fineness and in its power of felting. Long wool is much more uniform, and for this reason—that it is the produce of the Leicester race, and of races with which the Leicester race has become completely intermingled. "All long-woolled sheep," says Mr. Youatt, "both in appearance and in fleece, are becoming one family." Long wool, which is now very much improved, it being the aim of the breeder to render it finer (at the expense of its length, which it will bear), is characterised by strength and transparency, but it is deficient in the power of felting. Its average length is about eight inches. This applies more particularly to that sort called the long-combing wool; there is, however, a variety of long wool which approximates to the middle wool, and termed the short-combing wool, which is somewhat shorter than the other, finer, and more disposed to felt. The long-combing wool is used in the manufacture of hard yarn, and for purposes in which length and firmness are essential; the other is used for stuffs of a soft texture, and for hosiery goods. We have alluded to the Leicester breed as the typical example of the long-fleeced races; but it is to be observed that this breed is an improvement upon the heavy,

ill-made. and coarse-woolled race, formerly spread over all our midland counties. Lincolnshire also had a breed of sheep celebrated for its fine long wool; but this breed, defective in form, and yielding mutton of inferior quality, is now greatly improved.

There is one question which suggests itself, and which we cannot omit to notice. As far as records serve us, it would seem that a long woolled and a short-woolled (now middle-woolled) race of sheep have tenanted our island from the earliest times. To what causes, then, are we to attribute this original difference? Are the two races descended from different primitive sources, or have food and soil gradually produced the differences which have been so long maintained? No one, we think, will hesitate to say the latter; impossible as it may be to follow step by step the progress of the change, or to determine the *modus operandi* of the causes contributing to effect it. It is, however, very remarkable, that it is only in animals which have been so long domesticated that we cannot tell their primeval origin, and which there is reason to think are factitious beings (that is, the produce of different, but still closely-allied species commingling together), that these extreme variations as to size, figure, and length and quality of fur, are most decidedly observable. We see these varieties in the dog—from the silky, long-haired spaniel of Spanish race, to the close-haired old setter of the same country; from the woolly French poodle, to the mâtin; from the rough English water-dog, to the mastiff: so, in the sheep, we find a short-fleeced breed, with the filaments of the wool peculiarly fine, and numerously serrated; a still longer-fleeced breed, again subdivided into many minor varieties, and having the wool fine, and more or less capable of felting—or, in other words, more or less numerously serrated; and a long-woolled race of old standing, in which the wool, but thinly serrated, is inferior in felting properties, but of great value to the woolcomber. But further, as the mixture of a long and silky-haired breed of dogs with one of close hair does not improve the coat, the young resembling, some the male, some the female, but not equalling them in their excellences; so the crossing of long-woolled and short-woolled sheep leads to no good results; and, as it is with dogs, the improvement of each breed depends on a judicious and careful selection of the best and purest of that breed, by which the properties distinguishing it may be developed to their maximum in their progeny.

In England, the sheep is now only valuable for the sake of its wool and flesh; but in various parts of both Europe and Asia, the milk of the ewe has been used from the earliest times, either pure or curdled, as an article of diet. Formerly, in many parts of England, cheese was made from the milk of the ewe; and the ewes, to the injury of the lambs, were milked regularly, as described in the *Odyssey*, and, at a later era, by Virgil:—

"He next betakes him to his evening cares,
And sitting down, to milk his ewes prepares;
Of half their udders eases first the dams,
Then to the mothers' teats submits the lambs.
Half the white stream to hardening cheese he press'd,
And high in wicker baskets heap'd; the rest,
Reserved in bowls, supplied the mighty feast."

To the process of shearing we need scarcely allude; all are familiar with the manner in which the removal of the fleece is effected; and it would seem that, in the earliest patriarchal ages, the same process was in use. Among the Romans, however (and the practice has been but lately discontinued in the Orkney Islands, and is, perhaps, still prevalent in Iceland), the wool was torn off the animals; and, as Pliny states, they were kept for three days previously without food, in order that the wool might be the more easily detached, their bodies being exhausted. In his time, however, the practice of shearing had begun to supersede this cruel and unjustifiable method. It gave, however, origin to the word *vellus* (fleece), from *vello* (to pull away); and the hill termed Velleia was the ancient spot on which this cruelty was perpetrated.

With us, the season of sheep-shearing is a season of rejoicing; and the manner in which the important work is conducted, and the dexterity of the shearers, are, to those not accustomed to rural life, replete with interest and amusement. It is, indeed, a pleasing spectacle to see a large flock of snow-white sheep collected together, and, in turn, losing their soft fleece, rolled into an unbroken and well-arranged whole, beneath the shears of the shearer. The picture is poetical, and has been the subject of many pleasing representations.

CHAPTER IV.

HISTORY OF THE WOOLLEN TRADE.

Professor Owen defines wool as "a peculiar modification of hair, characterised by fine transverse or oblique lines, from 2,000 to 4,000 in the extent of an inch, indicative of a minutely imbricated, scaly surface—when viewed under the microscope—on which, and on its curved or twisted form, depends its remarkable felting property." In a state of nature, many animals have a covering both of wool and hair; the former underlying the latter; but a single fleece, whatever its character, yields many varieties of wool, which seems to have been the staple material of the primitive weavers of Palestine, Syria, Greece, Italy, and Spain. Previous to the art of manufacturing in wool, however, man, to clothe himself, made use of the skins of animals; and even in the patriarchal times, we find that the skin of the goat was used by Jacob. At this period, however, or very little later, the fleeces of animals came into use; for we find that Joseph had a coat of many colours, made him by his father, who would seem not only to have understood the proper application of the fleece, but, also, the art of dyeing it. Still later, we find Job saying to his three friends—"If I have seen any perish for want of *clothing*, or any poor without covering, if his loins have not blessed me, and if he were not warmed with the *fleece* of my sheep." Here is direct evidence that the fleece of the sheep was now used for the purposes of clothing. Weaving, in its rudest form, was probably pursued as a domestic employment at this time; for there is no handicraft more ancient, and none more universal. The allusions to this art in the Scriptural writings, have made us all familiar with it from our childhood. "My life is cut off as by the weaver," says Isaiah. "My days are swifter than a weaver's shuttle," says Job; and as weaving was, from the remotest antiquity, the occupation with which women engaged themselves, it has supplied the old epic and lyric poets with many a beautiful figure, and the ancient dramatists with some of their most touching incidents. The antiquaries who have unfolded the cerements of the Egyptian mummy—the travellers who have devoted themselves to the exploration of Central Africa—the missionaries who have familiarised us with the habits and traditions of the more than semi-savage South-Sea Islanders—all testify to the antiquity and the universality, in some form or other, of textile industry. It is apart from our province here to enter upon the history of such an art; but it is full of interest as developing the inventive faculties of man, in his onward progress towards a high and refined civilisation. Its history links itself with the colonisation of the Greeks; with the dissemination, throughout the new-born Italy, of the industrial arts of Constantinople; with the rapid rise of the Italian republics; and with that—more marvellous still—of the great commercial city of the Netherlands. When the textile industry of the Italians and of the Flemings passed over to France and to Britain, its development came to be intimately connected with three questions of state policy—namely, the good or ill treatment of aliens; the liberty or thraldom of religious worship; and the restriction of the enfranchisement of trade. With the mode of handling these three questions by government, the fortunes of weavers have been singularly involved. It is probable, however, that, contemporaneous with, or possibly antecedent to weaving, the process of felting was adopted. If wool be pressed together, or considerably heated in junction, or otherwise be brought in very close contact, it becomes a thick impervious mass, very difficult, if not impossible, to be separated again. This is owing to the structural conformation of the wool. Though the absolute cause was not known, the fact was understood and described at a very early period. The wool is covered with a complete series of scales, or serrations. These are capable of being opened and compressed; and felting is no more

than the junction of these, and their compression with one another. So far will this go, that even the smallest particle of wool seems to possess the above quality.

"It is to this felting property," says Mr. Milburn, "that we have long been indebted for our hats." It is mentioned in the *Iliad* of Homer. Plato speaks of it as "cloth made by the thickening of wool." Pliny, describing it with the more practised eye of an observing natural historian, says—"Parcels of wool, driven together by themselves, make cloth." Herodotus, when he describes the clothing of Xerxes' army of Persian soldiers, says, they wore "light and flexible caps of felt," which he also describes as used by the Medes and Bactrians. Julius Cæsar, finding his soldiers annoyed by the arrows of Pompey's army, describes them as making shirts or clothing of felt, to protect them from the archers. Thucydides mentions a similar device to protect the body from the effects of arrows. The more peaceful Greeks used the wool for a more pastoral purpose. They clothed their sheep with felted wool, according to Aristotle, in order to produce an impression on the texture and colour of the fleece. Tasso mentions that the Attic sheep were clothed to improve and preserve their fleeces; and Demosthenes calls them "soft sheep." It was the impossibility of felting the hair of the goat and the camel, doubtless, which first suggested the idea of weaving.

Tasso says—"As the sheep yields to man wool for clothing, so the goat furnishes hair for the use of sailors, and to make ropes for military engines and vessels for artificers. * * * The goats are shorn in a great part of Phrygia, because they have long shaggy hair. Cilicia (*hair-cloths*), and other things of the same kind, are commonly imported from that country." The character of this cloth is intimated in the prophetic symbols of the signs of the second advent:—"The sun shall become black as *sackcloth* of hair."

Dyeing seems to have been of very ancient origin; and nature appears to have suggested the idea in the rearing of black, white, and party-coloured sheep. But a taste for brilliant and glaring colours has prevailed in all countries and in every age; and although the art of dyeing is, like many other arts, indebted to chance for its origin, still it can be traced up to a very remote antiquity. We have already alluded to the "coat of many colours" possessed by Joseph; and as the Israelites, soon after their departure from Egypt, understood the art of dyeing scarlet and purple, or crimson, it is obvious, that at least 1,500 years before the birth of Christ, dyeing was practised among the Egyptians. The probability is that they derived it from some one of the Indian nations with whom they traded; but, be this as it may, it appears by Pliny, that the Egyptians even knew the use of what are called *mordants*, in fixing or modifying the colours which they made use of. "Tyrian purple" is alluded to by Juvenal. The Greeks seem to have been slow in acquiring this art, as, in the expedition of Alexander into India, it was so little known in his army, that the soldiers were surprised at seeing ensigns of so many colours used by their opponents. After its introduction to Greece, it passed into Italy, and thence into other European countries. Bætis had fleeces possessing "metallic tints," especially the prized "golden hue," and also the sober *native hues* of "Bætic drab or grey." The two colours of Spanish wool were said, in 1607, to be—one a golden yellow, and the other a ferruginous or brown colour. These colours probably depended on the soil on which the animals fed. Ancient monuments attest the remote period at which the wool trade was cultivated. On a Roman altar, dedicated to Hope, above the emblematic ears of corn and the bee-hive, is a distinct bale of wool. On the altar to Silvanus, is the caduceus of Mercury and a bale of wool, evidently tied with twisted and knotted cords, as if packed up for exportation. Amongst the Belgæ and the Gauls, woollen manufactures seem to have been common. The latter is alluded to in contrast to the proud purple, or Tyrian, and designated "goss Gaulish grey." In Juvenal's ninth *Satire*, allusion is thus made to Gallician manufacture:—"Some coarse brown cloak I may happen possibly to get—some Gallic fabric, as a defence from the rain." At the Roman conquest of Britain, Cæsar describes the inhabitants as a pastoral people, possessing cattle, clothed in the skins of animals, and subsisting on flesh and milk. This description especially applies to those who

lived north of the Thames. The inhabitants of Kent are described, by Strabo, as excelling the Gauls in their manufactures. Eumenius, in his eulogium on the Emperor Constantius, in 310, says—"And fortunate Britain, now the happiest country upon earth; for thou hast been the first to see Constantine made emperor. * * * Thy woods contain no savage beasts; thy land no noxious serpents; but an innumerable multitude of tame cattle, distended with milk, and *loaded with fleeces*."

Mr. Milburn thinks that there cannot be a doubt that, at the time of the invasion of Cæsar, there were two kinds of wool produced in this country, and two kinds of garments manufactured by the polished Belgæ, who inhabited Kent. The one kind was thick and rough, calculated to protect from the cold, and common to northern countries; the other, a fine soft material, resembling the Highland plaid. Doubtless the one symbolised the wool of the Teeswater or the Cotswold, and the other of the Southdown. That fine wool was then known, amply appears by the quotation of old Holinshed from Dionysius Alexandrianus, who said—"The wool of Britain is often spun so fine, that it is in a manner compared to a spider's thread." The decay of the arts, consequent on the irruption of the barbarians into Rome, does not appear to have extended to the woollen manufacture, as clothing continued to be made in most of the countries in which the Romans had established colonies. The wool employed was, at first, the produce of their own country; but they afterwards imported wool from other countries, and carried on the manufacture to such an extent, that the Low Countries became, in a great measure, the clothing district for Europe. Spain produced cloth for herself, and, about the thirteenth century, acquired considerable reputation for the beauty of her fabrics. Consequently, we may presume that the fine wool which the Spanish sheep have, for centuries, produced, is the best. The Italians and French entered on this manufacture at a later period. In the time of William the Conqueror, an inundation which occurred in the Netherlands, drove many of the clothiers into other countries; and some of them came to England. William of Malmesbury says, that the king, glad of such an accession, placed these Flemish clothiers first in Carlisle, and then in the western counties. From that time the mention of clothiers is frequent in the old chroniclers. London, Oxford, Lincoln, York, Huntingdon, Nottingham, and Winchester, are enumerated as towns wherein the manufacture was carried on; while, at other towns, there were cloth-dealers who paid a licence duty to the king for the privilege of buying and selling dyed cloths. Although, however, *clothiers* are frequently mentioned, it was not until 1140 that any very definite or distinct allusion is made to the British woollen trade by any historical document. In that year a petition was presented to King Stephen, soliciting the power to enable them, by his charter, to form themselves into corporations or guilds. The object of this petition was to possess, under the monarch, self-government; to have the power of appointing their own members, and subjecting them to such orders, laws, and regulations as they, from time to time, saw expedient.

The guild of Winchester, the old established seat of woollen manufacture, paid one mark (about forty shillings) for the power of self-government; and an annual payment of £16 is afterwards noted. The London weavers paid a similar sum; while that of Oxford paid forty shillings. Others paid even larger sums; which lead to the conclusion that these guilds had arrived at a considerable degree of importance. The Worcester guild paid 100 shillings for certain specific privileges; and, in ten years' time, the decaying London guild paid £12 only. In 1172, prohibitions against mixing Spanish with English wool were issued, probably from a desire to stimulate improvement in the native material. If this were really the intention, it had the effect of throwing the British on their own resources for the manufacture of broadcloth; and from that day they acquired the power of manufacturing it independent of Spain.

The religious crusades of the middle ages drained the country alike of its fanaticism and its money. So impoverished was our Richard I., that when he was imprisoned by the Duke of Austria, he had his heavy ransom of £300,000 paid by levies on the plate of the avaricious monks; and when they had no plate, they had to send one year's produce of wool. Into their hands the best of the sheep

lands, and most of the silver, were very rapidly finding their way; and hence they afforded a ready means of raising the ransom of their king from the hands of the freebooter. In the reign of Henry I., another inundation in the Low Countries brought more Flemish weavers to Britain, and gave a new impetus to the cloth manufacture. The *Gilda Sellariorum* is of this reign, and is the oldest of the London companies. It possesses a charter of Henry I., which exacts that none but members shall have the power to intermeddle with their craft within London, Southwark, or the parts adjacent. This charter was confirmed by Henry II. and by Edward I.; but in the fourteenth of Edward II., the privileges claimed under it were brought into question by a writ *de quo warranto*. The consequence was, that the company had to moderate its pretensions; but it continued to exercise an important jurisdiction for several centuries. During the struggles of the barons with the monarchy, the woollen trade seems to have become depressed; and Sir Matthew Hale says, that in the reigns of the two first Edwards it was "wholly lost," and the money for wool was made by exportation. The Flemings had again established their manufacture, and beat the English out of the market. The third Edward set about restoring it by vigorous means. Aware of the impetus given to it before, by the importation of Flemish weavers (or from their present skill in beating out the English manufacture), in 1331, he brought John Kemp, with seventy Walloon families, from Flanders, and an act of parliament was passed to encourage them. Flemish or other foreign goods were also prohibited by statute; and, to crown all, exportation was altogether prohibited; although it had before raised the sum of £534—a large sum in these days—equal, perhaps, to £8,000 of our money; and this at a period when population and trade were equally scanty. The promises made by Edward to the Flemings, during his visit to the Duke of Burgundy, were faithfully kept. Part of them were located in Kent—the seat, no doubt, of woollen manufacture before the Roman conquest. Some settled in the valleys of the Severn, where they established the celebrated manufacture of West of England cloths; while others went to the valleys of the Aire, where they found situations and water suited to their requirements. The two latter localities are still the seats of woollen manufactures in this country. "Happy the yeoman's house," says old Fuller, in his characteristic way, "into which these Dutchmen did enter, bringing industry and wealth along with them. Such as came in strangers, soon after went out bridegrooms, and returned sons-in-law, having married the daughters of their landlords who first entertained them; yea, those yeomen in whose houses they harboured, soon became gentlemen, gaining great estates." Edward strengthened both his purse and his country by these judicious steps. He found that the woollen trade he had encouraged, afforded the sinews of power in his wars with the French; and when English wool again found its way to Flanders, in 1337, it sold for £100 per sack; and 10,000 sacks were sold at that time in Brabant. In 1342, the king exported to Cologne a great number of sacks of wool, in order to redeem Queen Philippa's crown, which had been pawned there for £2,500 sterling. The average of wool at this time, was 1*s.* 3½*d.* per lb. Previous to this period the wool had been weighed by means of steelyards, of nearly the same construction as those used in some country places at the present day; and hence the yard in which the merchants usually met was designated "steel-yard." In 1352, the weighing by the steel-yard was prohibited, on account of the deception practised with it, and an equal balance was introduced.

The reign of Henry VIII. imparted an impulse to cloth manufacture, though his enactments appeared calculated to repress it. Still, when one man (John Winchcombe) could equip sixty soldiers at his own expense, and maintain them at the battle of Flodden Field, it is evident that his one hundred looms had realised him a considerable profit. This was a way in which the manufacturers were able, when willing, to assist their monarch. The privileges to certain cities, for services rendered, doubtless had an origin somewhat in this manner. York had an exclusive monopoly granted in the manufacture of coverlets; and worsted spinning was limited to Norwich. Another impetus was given to the trade by Elizabeth; whilst the severities exercised by

the cruel Duke of Alva on the protestant manufacturers of the Netherlands, caused many of them to emigrate to this country. To these it was the policy of Elizabeth to extend her protection, well knowing the skill which they had in weaving, and the improvements which they were likely to introduce amongst her own native subjects. Five hundred of these refugees settled in London; and the southern seats of manufacture had large accessions of weavers. The scarcity of hands complained of in the reign of Henry VII., was no longer heard of; and Norwich was not necessitated any more to deplore the paucity of manipulators in her manufactures. In this reign, trade with Russia, and the formation of a Russian trading company, followed, and still further increased the foreign relations of the country. The Turkish Company was established in 1581; the African Company in 1585; and the East India Company in 1600.

In 1667, importation of foreign dyers took place. They arrived under the guidance of a person of the name of Brewer. The principal English dye had hitherto been wood; but he taught them all the mysteries of dressing cloth as well as dyeing. In the reigns of Charles I. and II., the public turbulence and arbitrary interference seem to have crippled the trade. By Charles II., as well as by the Commonwealth, the exportation of wool and sheep was strictly prohibited. But in the reign of William III., manufacturers made steady progress. Considering Ireland to be a linen manufacturing country, he discouraged the woollen manufacture there. Florentine wool manufacture was stimulated by every means, legitimate and otherwise, and Sweden began to rival England; the silk trade was pushed, and a general activity pervaded all classes of the community.

The Georges encouraged the woollen trade; and they were indebted to it in more ways than one. Manufacturers and staplers raised troops to assist them to repel invaders. John Routh, a stapler of Thorpfield House, in Yorkshire, raised a troop, and had colours presented by his sovereign, George II., for his loyalty. The king also granted a charter, conceding freedom of tolls to John Routh and others, on the Aire and Calder rivers—an immunity of great value to a wool-stapler. In the reign of George III. our manufactures rose to their pinnacle of greatness; and, though heavily taxed, we were enjoying the blessings of peace when all the rest of the world was at war. A large portion of our national debt doubtless passed into the hands of the British manufacturers for the cloths they made; and fortunes were realised, which created the *millocracy* of England. In this reign, inventions in mechanical appliances, stimulated, doubtless, by the vast demand for woollen goods during the war, raised the English clothier to the highest opulence. At this period we obtained wool from Australia, Germany, Spain, Russia, the Cape of Good Hope, South America, and the East Indies. In England, the woollen manufactures will always be intimately bound up with its pastoral character. Though dependent on foreign countries for a large amount of the raw material, it still produces within itself a vast proportion of what it requires; and the paying character of sheep, both directly and indirectly, has a great tendency to maintain mutual dependence and reciprocity between the wool grower and the manufacturer. The present extraordinary rage for cheapness is amongst the most wonderful tendencies of the age. It is inducing the English manufacturer to make up fabrics mixed with calico, and to work up wool-dust, which is not only unprofitable to the wearer, but must ultimately have a tendency to bring discredit on himself, and those with whom he is connected.

CHAPTER V.

BREEDING AND REARING OF SHEEP.

WHATEVER may be the object of the scientific, wealthy agriculturist in cattle or sheep breeding, it is evident that, in the case of the farmer, it resolves itself into a question of plain pounds, shillings, and pence. In breeding the sheep, however, the same principles which regulate the production and improvement of any other class of animals, must, in a great measure, be acted upon; and should one person be more successful than another in the production of stock, that person will be found to have given greater attention to the subject, to have been more persevering, and to be possessed of qualities better adapted for carrying out the object in view than the other. The question for the consideration of the farmer is, what kind of animal will ultimately become the most profitable? This is the all-important interrogatory which he must put to himself. The present or immediate he must sink in the comparatively distant; and, whatever may be his diappointment, he must persevere, and try again and again, until the arrival of the triumphant day which is certain to crown his efforts with success. It was thus that Bakewell acted. It was by unwearied perseverance that he succeeded, at last, in producing his New Leicester, which, in the end, rewarded him for all his labours.

The New Leicester and the Southdown are the two breeds which have occupied the attention of the agricultural world in putting forth their claim to favour. As far as a tendency to fatten and to arrive at an early maturity are considered, there is no doubt that the Leicester stands foremost in every known breed of sheep whatever. For the attainment of these qualities, its form is a perfect model of adaptation; and all other breeds which most closely resemble this form, will possess these qualities in a more or less degree. Even the Southdown is no exception to this rule; for if one of the improved, and another of the neglected specimens were placed together, the excellences of the former would at once appear to lie in those points which had the nearest approximation to the Leicester. The production of wool, too, is also to be considered; for the fleece of the Leicester is much longer than that of the Southdown. Where, therefore, the pasture is favourable, and the sheep taken care of, and not unduly exposed to cold and wet, the Leicester must be esteemed the most remunerative of the pure breeds. What, however, are its drawbacks? These are, says Mr. Spooner, the incapability of the animal to bear exposure, for travelling, or living hard, being weak in constitution, and very liable to inflammatory disorders. From these circumstances, it is unfitted for folding purposes, or to stand the exposure of the Southdowns, and still more for bearing up against the severities of the Grampian Hills, or the Welsh mountains. In the climatic variations of these localities, the sheep would soon perish. Besides these drawbacks, their mutton is by no means so good as that of the Southdowns, which, however, is partly owing to the early period (twenty months) at which they are ready for the butcher, and partly to the very large quantity of tallow they make in proportion to the lean. Their mutton, therefore, is not much esteemed in the London markets. Accordingly, the first cross between the Leicester and the Down has been raised instead of the Leicester; and it is said that this first cross is the most profitable sheep that can be fattened, making greater and more rapid progress than the Down, and yielding a better quality of meat than the Leicester.

The improved Southdown is also possessed of most valuable qualities; its tendency to fatten being inferior only to the Leicester. It is also later in coming to maturity, taking from thirty to thirty-two months; but it is an excellent traveller, folds well, is hardy, compared with the Leicester; can live on short pastures; and is, perhaps, the best of all the breeds for the Down farmers in the south of

England. With the exception of the small mountain sheep, its mutton has a higher reputation than any other; and these qualities, with the wool it produces, have enabled the breed, also, to hold a foremost place in the favour of the public. With these two valuable breeds, each adapted to different pastures, it may be asked, what need is there for any other? It will, however, be found that, in the marshes of Kent, and many other places, the superior hardihood of the native breeds has rendered them more profitable than the Leicester; though, unquestionably, crosses with the latter have much improved their value. Notwithstanding the valuable qualities of the Southdowns, however, they have been found insufficiently hardy to endure the severities of the Grampian hills, or the Welsh mountains. They have been tried, and found wanting. In these bleak situations, vast numbers of them have fallen victims to the inclemency of the weather; and the losses which many speculators have sustained, have been the cause of discouraging others from following their steps.

Where breeding is the object of the farmer, the first rule to act upon is to breed from the best; but this has its limitations and restrictions, as will be seen in the following illustrations of Mr. Milburn:—"A man may easily ruin his flock by adhering to this rule, without attending to its antecedents and adjuncts. There are two modes of effecting it. One man will scour the whole country to obtain the best ram, or to buy a few prize gimmers. From these he will select the most promising, and insure better alliances for his flock. The result will be a set of nondescript mongrels. Some distant impurity of breed manifests itself; some tendencies, far back in the genealogy of the race, break out, which are modified in one case, and fostered in another, until the flock shows signs of indiscriminate and injudicious dabbling. Another man, better acquainted with the rules that regulate vitalism, takes his own flock; and, having selected the best, he takes only those which he *knows* to be of the same breed; and thus goes on steadily aiming at giving breadth to the animal. He knows that the sheep, in order to thrive, must have a large lymphatic system. It must have a capacious chest and loins, and a frame on which to secrete fat, with lightness of offal. Hence he does not select, at first, that which has the most of these qualifications, but which has, perhaps, the widest form, and most unlike his own flock: he also takes such as show a tendency to pervade, in one uniform direction, not an individual, but the whole of the flock; and this he takes to mend his own. By this means all are a little improved in the direction he requires; and all keeping *alike* in their general contour, there is a kind of permanency and uniformity in the main features of the improvement. Hence, if we look at the flock of the first-named breeder, we shall have breeds both large and small, 'bony' and 'bloody,' rough and fine, white faces and blue, coarse and tender—in fact, a set of mongrels, none of which are of sufficient value wherewith to form a flock, and none to be depended upon for any future breed. The other breeder, by his cautious and judicious course, has a *uniform flock*—a mark both of purity and of skill; for no unskilful man ever kept a flock long in a state of anything like similarity to each other. Uniformity is as important to the jobber and the butcher as it is to the grazier. The merit of being 'even' is always appreciated in a market, because it always suits the same class of customers. One butcher buys a large fat animal; it suits his friends: another, a light, thin one (wool being required by one, and mutton by another); one requires fat, and another muscle; and to make an uneven lot of sheep sell for all they are worth in a market, they must be judiciously sorted."

Whatever may be the breed selected, it should be suitable, and, in its management, be tended with the greatest care and attention. Theory and practice have clearly shown that health and thrift are intimately connected in the breeding of sheep; that the influence of cold has such a deteriorating effect upon the body, that it contracts its proportions, and renders a greater supply of food necessary to support it. Therefore, to a certain extent, warmth is a substitute for food. This, then, suggests the great importance of the covering of fleece during the winter. It preserves the temperature of the sheep, and prevents waste; and shows us the reason why animals thrive better in the summer than the winter, except during the very hottest period. The usual

course adopted in breeding is, to take one of the owner's ewes, and buy it, or put it to the ram of another breeder. Before doing this, two selections have usually been made by the breeder; first, those ewes which are so favourable to the object he has in view, are drafted from his flock; after which his best gimmers are selected from the flock of the preceding year; he next chooses a ram of the same breed, suitable to their condition, and possessed of such characteristics as he wishes to be reproduced in his stock. The ram should be thoroughly bred; and unless it be one of his own, with the qualities of which he is perfectly acquainted, it should have been tried at least one year on a small number of ewes of a good sort, in order to test his excellence. This is commended as safe-breeding; but if uniformity of flock, and purity of blood, are the objects desired to be obtained, the surest way to get them, is by adopting the best means. It must always be borne in mind, that the improvement of a flock, by means of breeding, requires not only very great caution, but long-continued attention and care.

In breeding, the qualities of both parents must be considered, equally with a view of eradicating the bad, as well as perpetuating the good qualities. Speaking on this subject, Professor Spooner, in his treatise on the sheep, remarks, that it must be acknowledged, that in the majority of cases, the influence of the male preponderates over that of the female, and the characteristics of the former are more likely to be impressed on the offspring than those of the latter. This, he says, is shown in most animals; and instances several cases. "The mule," he says, "partakes much more of the nature and size of its sire, the ass, than its dam, the mare. A large Cotswold ram, put to a Down ewe, produces an offspring much more resembling the former than the latter; and a pony mare, put to a full-sized horse, will produce an animal half as large again as the dam. Though this, however, appears to be Nature's rule, it is not without exception; for, occasionally, we see the very opposite results. In breeding animals of a pure kind, the principal rule to be observed, is to breed from the very best of both sexes, and cull the faulty ones every year, saving only the female lambs for the future flock that are as free from defects as possible. Of course the flock must be kept up to its proper size; but, year by year, the finest animals should be selected, until, in the course of time, the flock will entirely consist of them. When this is nearly accomplished, it will not be prudent for a farmer to employ his own tups for the purpose, as he will probably be able to hire superior rams from others; and it will not do to spare expense in thus raising the character of his sheep.' When a difference occurs in the general outline of a flock, it is to be corrected by the breeder acting on the flock itself, by regularly drafting off the failing ewes, and breeding from the common size. This is said to have a very favourable influence on the breed—much greater than that of the dam; for, while she can only influence two animals, the ram exercises his power, in a greater or less degree, over the whole of the produce. The leading features to be attended to in a ram, are, fineness of skin, light offals, broad, deep, and round frame, and the absence of superfluous coarse wool. The back should be broad, especially near the shoulders, and well covered with solid, but yielding, and slightly elastic flesh; though it is sometimes said, that an animal on which it is possible to get a full fat development, is one to be selected, on the ground that, in a bad one, this is impossible. As adipose matter, however, is necessarily laid on muscle, it is obvious that where there is plenty of muscle, there also fat may be expected. A deep chest, broad at the base, is very essential; for this is indicative of *weight*. For successful feeding this must be thoroughly capacious. The sheep should walk *wide* on both legs, keeping them at a distance of at least six inches parallel to each other. The head should be fine, not flat, and rather broad. The eyes very full and prominent, exhibiting, on the whole, an expression of quiet liveliness. The ears small; and the bare parts—the face, ears, and legs—must have a clothing of fine hair or wool.

The colour, which varies according to the breeds, is of great consequence. A departure from white in the Cheviot, would be as great a failing as black in the Highland or the Heath sheep; brown in the Southdown, or blue in the Leicester. Mr. Milburn thinks that the colour of the face of a Leicester is of far more consequence, in a fattening point of view, than

is generally imagined. It ought, in his opinion, always to have a tendency to light-blue in the ram, or some Leicestershire or Teeswater tampering may be suspected. Good legs is another great essential. The tendency is to encourage flesh developments on the back, to the neglect of the legs, especially in the Leicesters. The fine development of the back seems not only to have robbed the leg of its muscle, but, by contrast, to have exaggerated its own deformity. The dread of a long, coarse leg of mutton has diminished the circumference, as well as the length; and, though a short leg of mutton is desirable in a Leicester, we must guard against a loss of its rotundity. Size is also of consequence. The finest specimens of Leicester—the purest and most symmetrical—are now decidedly the smallest. Breeders should earnestly look to this, and be careful, in selecting the ram, to have masculine qualities enough to secure a hardiness in the flock. In reference to the various points sought after by breeders, not because of their own intrinsic value, but because of their being evidence of other valuable qualities, is an aptitude to fatten, and the attainment of an early maturity. In the Southdown breed, for example, small heads, legs, and horns are esteemed, because experience has pronounced them qualities which are found usually associated with fattening properties. Black muzzles and legs are, also, highly valued, because they are indicative of a good constitution, and a certain degree of hardiness, which speaks well for the animal. Roughness of the back, roundness of frame, and breadth of loin, are also points in great request, being not only the signs of good qualities, but, in reality, good qualities in themselves. Straightness of the back, although perfect in the Leicester, is not natural to the unimproved Southdown, but rather the contrary. In the improved breeds, however, it appears, and is considered an excellent point, as it gives a greater surface for the accumulation of flesh, and affords larger scope for the abdominal organs. The opposite of this, as witnessed in a round or convex back, is produced, and increased by the effects of hunger and cold, and is almost sure to make its appearance, should the breed be exposed to neglect, and the rigours of an inclement season. In summing up some of the profitable requisites of a well-formed animal, it may be stated, that it should have as much flesh, and as little bone and gristle as possible; and this flesh should be found where it is most wanted, and, therefore, most valuable. For example, it is much more profitable on the loins and quarters than about the head, and upper or scrag-end of the neck. Where there is a large development of flesh, a proportional disposition to fatten may be expected; but to be profitable, it is necessary that these qualities should be early developed, or, in other words, should be exhibited by an early maturity.

Having described the points of the ram, we may observe that the ewe should be straight and broad-backed, wide in the loins, and deep-breasted. The angles of her frame will always be sharper than those of the ram; but depth and breadth, with fineness about the throat and legs, ought always to be specially attended to. To secure uniformity in the flock, the ewes ought always to be as much alike as possible, otherwise it will be the next thing to an impossibility to obtain this desirable object. We have already observed that, in breeding for improvement, it is a good rule to breed from the best of the kind; and if a superior ram of the same breed can be obtained from another flock, it ought to be taken, and a preference given to it, should its qualities be equal to any one possessed by ourselves. If our own, however, excel all others within reach, then it should be used, but with the precaution of marking the ewes which are deficient in any of the qualities desired to be perpetuated.

Cross-breeding of sheep has attracted a great deal of attention; and its object is either to increase the size, or to improve the form; to stimulate its fattening tendencies, to give it an earlier maturity, and to extend the length, or enhance the quality of the wool. To practise any of these improvements, it might, at first sight, appear that all that would have to be done, would be to select a ram of any special breed, distinguished for the particular quality desired to be produced. This, however, will not always prove suitable; for, by so doing, a breed will frequently be reared, either weak in constitution, or defective in form, on account of the too great dissimilarity between the parents. Therefore, to render crossing

successful, it may be taken as a general rule, that there should be some affinity of constitution between the intended improvers, and those sought to be improved; and this affinity is sometimes denoted by the character of the wools. The most usual crosses are those of the *Leicester with the Southdown*. The true Leicester is unfashionable, is fed too early, and is said to be too fat for its amount of muscle to secure favour at the tables of the rich epicure. Luxury seems greatly inclined to discard that profitable animal; whilst the Southdown has been selected to impart a quality to the mutton, a fineness to the fleece, and a tendency to lay on fat, with hardihood.

Some of a flock of this breed were seen by Mr. Milburn, at the farm of Mr. Johnson, of Chevet Grange, near Wakefield, in the West Riding of Yorkshire; and he speaks greatly in their praise. He says—"We happen to have seen some extraordinary specimens of his flock, embracing, perhaps, more of the qualities of the two breeds than could be conceived possible. There was considerable size; a heavy fleece of the finest wool; large frame; plenty of fine-grained mutton; with early maturity, and a fair mixture of fat and muscle. These are qualifications seldom realised in one animal. What is more, they were precisely like each other. The result seemed uniform; and though they cannot be considered as stereotyped characteristics, yet they are qualities preserved with considerable tenacity, and, we are assured, not at all obliterated by continuing to breed *in-and-in* with the crosses. Be this as it may, the result is pretty certain; and a good flock of Southdown ewes, put to a Leicester ram, may, with pretty considerable accuracy of calculation, be depended upon as a successful cross of sheep—fashionable to the butcher and wool dealer, profitable to the farmer, and more to be depended upon to meet a market than, perhaps, any other class of sheep, if we take the average of the run of seasons. We have heard of the reverse. Mr. Johnson has himself succeeded in breeding good produce from Leicester ewes and a Southdown ram; but we think that evidence is entirely in favour of the reverse of this cross."

The Cotswold is sometimes crossed with the Leicester, to which size is thereby given, as it is the custom to feed them at one year old. A successful cross has, also, been made between the Hampshire Down and the improved Cotswold. The Cotswold or Gloucester sheep is of large proportions, and has for centuries been famous for the length and weight of its fleece. As one of the long-woolled races, it is superior to most others; but its carcass could not bear comparison with the Leicester. After being crossed with it, however, it greatly improved in its fattening properties, and attained an earlier maturity, whilst it continued to preserve the quality of its fleece. The Hampshire was originally, in a great measure, derived from the flocks of Essex, and is a larger variety of the Southdown. Either from choice or economy, the largest and coarsest animals were selected and crossed with the native horned sheep, and this breed has been perpetuated on the farms of North Hampshire for years.

A cross between the Leicester and the Black-face is now well established, notwithstanding the wide difference which exists in the character and habits of the two breeds. The excellent mutton qualities of the one, and the fattening tendencies of the other, have caused this race to be extensively cultivated in the north, where large numbers of them are reared, and where they are held in very high estimation, not only on account of their mutton and their hardiness, but for the excellence of the wool which they yield. For this cross, however, it is not the very highest kind of Leicester that is chosen to produce it. It is the good and the useful, rather than the delicate. Therefore, they possess in themselves a certain degree of hardiness, which renders it more easy to acclimatise them to the temperature and hill pastures of Scotland. The cross between the Leicester and the Cheviot is also established, and the produce of this cross is rapidly taking the place of the pure Cheviot. Its size is greater, its fattening tendencies better, and it attains to an earlier maturity. Another cross, in the north, is noticed as being somewhat successful. It is between the Cheviot and the Black-faced—the rams of the latter, and the ewes of the former. This cross, Mr. Milburn says, is calculated for barren pastures, and such exposed situations as cannot be so well borne by any of the other crosses already specified. This cross, as might be expected, produces an extremely

hardy race, in which the quality of the mutton is not at all deteriorated. To obtain it, however, requires considerable perseverance, as the first is not always successful. When gradually carried back to the pure Cheviot ram, it greatly improves, when good mutton, better wool, and heavier weights are secured. Complications in crossing are considered neither safe nor successful.

Breeding from close affinities, or, in other words, *in-and-in* breeding, has been much discussed: and, in the estimation of many, is still an unsettled question. Whatever may be its advantages, it certainly has its disadvantages. Sexual intercourse is forbidden by the law, between near relatives in the human subject; and even marriage between relatives of the second degree—such as cousins—is looked upon by many persons as very objectionable, from the liability of entailing disease on the offspring, and especially disease of a mental kind. This opinion is strongly supported by statistical facts bearing upon the subject. "In the animal," says Professor Spooner, "there is no reluctance to sexual intercourse between the nearest affinities; and the custom of breeding from sheep closely related, has been, for a long time, practised by breeders of considerable eminence. In the human subject, the objections to the practice are at once granted; but let us see whether they likewise obtain with animals. In the former, marriages are generally entered into, with little, if any, regard to the health of the individuals concerned; the consequence of which is, that the diseases of the parents, or, rather, their predispositions, are entailed on the offspring. The result of this is, that most families have predisposition to some particular complaint; and thus, if two members of the same family have sexual intercourse, the probability is, that if both parents had predisposition to a particular disease, in an equal degree, this will be increased in their offspring in a double ratio. But, on the contrary, if a man unites with a woman of a different family, and a different predisposition, the idiosyncracy of the offspring to the diseases of either parent is likely to be prevented or retarded. With animals, however, the case is very different. If due attention be paid, a principal object will be, to breed from healthy subjects, by which means one fertile cause of hereditary predisposition to disease is prevented. A healthy form and sound constitution are essential to successful breeding, and for the development of the points we seek to obtain. Thus, the principal objection to breeding from near affinities, which exists in the human subject, does not obtain amongst animals; and even if, in the former, mental disease is more apt to occur when this practice is pursued, this, also, is an objection which does not apply to animals; though it has been urged by some, that sheep bred *in-and-in*, are more subject to diseases of the brain—a conclusion, however, which I am much disposed to doubt." From this passage, then, it is evident that the effects of *in-and-in* breeding may be productive either of good or evil; although, in neither case, may this result be attributable to nearness of affinity, but rather to the circumstances with which it is connected. If due care is not taken in culling, or making a selection of the flock, both defect and disease may reasonably be expected to arise; and two animals, having each a predisposition to the same evil, defective, or diseased tendencies, if permitted to have connection, will produce an offspring similarly predisposed, but in a double degree. If proper care is employed, however, in the selection of the flock, the opposite result may be anticipated.

In managing rams and ewes for the purposes of breeding, care should be taken, that about the close of the month of September, the ewes are put upon better keep. Rape is, perhaps, the best thing to give the Leicesters; but if this be not present, aftermath or clover stubble. If a large progeny is the principal aim, such food will be found greatly conducive to the effecting of this object. It is said, that of keeping sheep on rape before the ewes are permitted to receive the ram, fully thirty per cent. of lambs may be obtained. Climate, and the quantity of spring food provided, must, of course, in a great measure, regulate the time when the rams are to be put to the ewes. It is of the utmost importance that the lambs should be dropped as early as possible, in order that they may be well nursed, and have sufficient time to gather strength enough to enable them to provide for themselves before the winter sets in. It is also advantageous to the ewes, that they may arrive at good condition before the

commencement of the rutting season; thus a full crop of lambs may be secured. A proper proportion of tups should be employed—say, three to one hundred ewes, if they are much scattered; but, if they are kept in enclosures, two will be sufficient for a hundred. "A ram, when shearling, or two shear," Mr. Milburn says, "will serve sixty ewes, or even eighty, if proper care be taken. The too common mode is to allow him to run with the ewes at large. There is a great waste of the animal's virile powers; and when as many as the last-named number of ewes are given him, another course should be adopted. A shepherd should be left in entire charge; a pen or pair of stocks, as it is indifferently called, provided, and the ram kept confined in the house, or in a very small croft. An active lively ram should be sent with the ewes, and should have an apron tied about the crop, so as entirely to cover the genitals. If his breast is smeared with red it is no disadvantage, as it more distinctly marks the ewes. When a ewe is observed in full season, she should be brought to the stocks, and served by the ram with whom she is intended to produce, and immediately carried away; but, when eighty ewes are provided, it is indispensable; and when twenty to thirty guineas are given for the loan of a ram for one season, it is not unreasonable to expect him to discharge more duties to the flock than is possible by running at large. When the flock comes in season very rapidly, the ram serves them only once; if not, they are served twice, and then turned away for a fortnight, when they are brought back to the teaser; and he is then smeared with a blue or black colour, to distinguish those who come once. When the ewes are not named, they should all be numbered, and a register kept of the ram and his breeding, and the date of each ewe being served. This is not only an invaluable record in the case of pedigrees, but it is still more useful as being a guide to housing, when near the period of lambing; and, though the doggrel distich is true, that—

"'There was never a shepherd, that ever begun,
Can tell whether they go nineteen, twenty, or twenty-one;"

still, a very important classification is secured by those who have their register, who cannot house the whole flock, especially in a time of severity and difficulty. When the active process of gestation has commenced, care should be taken to prevent the ewes getting too fat. If they do, inflammatory disease, absence of milk, and general risk, are sure to be the consequences." The apron alluded to in this passage, is believed by Dr. Parry to have been an invention of the celebrated Bakewell. The sexual appetite of the ewes being provoked, and their condition being discovered, by it, they are taken in succession to the proper ram, which is kept in a yard or small enclosure, and permitted to serve each only once. The common practice, on high farms at this season, is to collect the ewes, and drive them to the low ground; but this has frequently the effect of harassing the animals, and spoiling the winter pasture. If they be altogether left at liberty, however, an inconvenient number of rams is requisite. The duties of the shepherd at this season are extremely onerous, as he must be constant in his attendance. If the weather permit, the ewes must rather be kept on the high ground, in separate bodies, scattered here and there, in accordance with the nature of the pasture, and the condition of the ground. Each of these detachments should have a proportion of rams allotted to it; and the shepherd cannot be too careful in not allowing the lambs to quit the ewes to which they have been appropriated. If this be done properly, fewer rams will be required on the ground. When the ewes have become large, they should be run about as little as possible. Nor should they in any way be disturbed, but carefully watched over, and kept away from wet ground, and everything that may be supposed to have an injurious effect upon their health. When very heavy, they are apt to get cast, and unable to rise; and when this is the case, the shepherd should approach them with gentleness, and help to raise them with as much tenderness as he can use. Should a ewe miscarry in very cold or severe weather, she should be brought to her cot, and kept there until she has recovered. In mild weather, however, she will be equally safe in the open air. When the yearning time arrives, the ewes should be placed on the most level and driest ground, not only for their own accommodation, but for that of the lambs when dropped.

Having alluded to the onerous duties of the shepherd during the breeding season, we may here observe, that one, whose pastoral care lies among the mountains, must be possessed of certain qualifications to enable him to act upon his trust with pleasure to himself and satisfaction to his employer. He must be active, attentive, careful, honest, and good-tempered withal. This last qualification is as indispensable to make up the character of a good shepherd, as it is to complete the character of a moral philosopher or a sage. Should he suffer himself, at any time, to get into a passion with his sheep, the probability is that he will not only injure them, but act greatly to his own disadvantage in herding and working among them. This observation is not applicable to the shepherd alone. It applies to every man who is in a position to govern, command, or control. He who loses his temper, generally loses a portion of his time, as he certainly does, a portion of his reason, which temper must again restore, before he can do for himself, or get others to act for him satisfactorily. A lad or shepherd, and a close-mouthed dog, will accomplish the object desired in half the time, and with half the trouble which will be given to the quick-tempered, passionate man. It is not by running and hounding his dog after them, that sheep are to be easiest driven to where they are wished; but by quickly directing them, agreeably to the quality of the soil, the nature of the climate, the locality of the farm, where they may obtain in greatest quantity, and with certain safety, a sufficient supply of nutritious food throughout the year. In Little's *Practical Observations on Mountain Sheep*, it is remarked, that "it is not by walking much or seeming to be doing much, that a shepherd proves himself to be a good one; but by walking so as to disturb the sheep the least, and by doing, and at the time, whatever is necessary to be done. There is not an experienced shepherd, who does not, as soon as he rises in the morning, and observes the state of the weather, know almost to a certainty where to find nearly every sheep on the hill; and he will, accordingly, take his course to the place where he knows his presence is most wanted. If any of his own or his neighbour's sheep have trespassed, it is foolish to dog or to abuse them; but the more quietly they can be turned back the better. If the boundary should be on the top or ridge of a height, towards which sheep are apt to draw at night, it is better to turn his own a little closer to the boundary in the afternoon, than to drive back his neighbour's; it will better answer the same purpose; and, after the flocks have been a few times gently directed in the morning, without dogs, they will become so well acquainted with their own side, that, at the very sight of the shepherds, they will take to it without trouble. Those shepherds who dog and force their flocks, I take to be bad herdsmen for their masters, and bad herdsmen for the neighbouring farmers. If the boundary be a bourne or brook on low ground, where the sheep graze in the middle of the day, the same plan should be adopted by turning the sheep down tolerably early in the day." These observations, although directed to the mountain shepherd, have yet, more or less, an application to every one who has the care of sheep in any situation.

About a fortnight before the expiration of the period of gestation, the ewes should be separated from the flock, and placed in a grass croft near the house. They should be sheltered by being allowed temporary houses made of hurdles and straw, with smaller houses, in which the newly-dropt lambs may be separated from the rest, and kept free from danger. This is not always practised; but it ought to be done; and for the lambing season, a croft of winter-freed grass, or uneaten moss, should be preserved. To save the grass at a time when, from a backward spring, or other reasons, it is scarce, the ewes may be driven daily to the turnip-field, and taken at night elsewhere—a plan which, by giving them exercise, will be found very beneficial. The best food for the ewes, after shelter is no longer necessary to the lambs, is Italian rye-grass, or rye, which, after being eaten down, grows rapidly; and nothing teaches the lambs to eat sooner than this. The corn should still be continued along with Swede turnips; while the advent of fine weather, and the diminished wants of the lamb, will be the criteria for deciding when the practice ought to be discontinued. When lambs are observed to drop on a spot where they cannot easily rise, they should be lifted, and placed on their feet; but if everything be favourable, they are better

left to themselves. When a day or two old, they may be docked, which will be the means of saving a great deal of trouble afterwards, when the disease called "pinding" attacks them. About three inches is, perhaps, a length sufficient for the tail; but males, provided pinding does not take place, should not be docked until the season for performing the operation of castration has arrived. When lambs exhibit little signs of sportiveness, in all probability there is something the matter with them, and they should be examined, as well as their dams. By nature they are lively and frisky, full of fun, and much given to play; if, therefore, they exhibit little or no signs of this disposition, it may be taken as a certainty that there is something the matter, either with them or their dams. If they are in any way deformed, they should be slaughtered for home consumption. Should a lamb die, it ought to be slowly dragged home, when the ewe will follow it. After she has been brought into the house, a twin lamb from another ewe may be put to her; and, as soon as she has allowed it to suck, they may be both turned out together.

In the *weaning* of lambs, the ewes should be taken from the lambs, and not the lambs from the ewes. It is said to be always best to place the ewes and lambs together in a pasture most suitable for the lambs. The ewes should be carried out of hearing of their offspring, and placed in a poor pasture, and milked for a few days, until the lactiferous system ceases to secrete, and then it is best to send them to a cool upland, if possible. Lambs, however, should be allowed to suck during three months and a-half, after which they may be taken up and kept for a fortnight or three weeks, at a distance from their dams. Sale lambs are usually not taken up till their purchaser comes and removes them at once. It is the practice of some to wean their lambs about the middle of July, considering it as important to habituate them to a change of provender before the arrival of the season when braxy is likely to set in. If nature were to be taken for our guide, however, early in August would be sufficient time for the removal of the lambs.

Should lambs become infested with vermin before the time of smearing, the following directions, given by Dr. Parry, will be found serviceable:—The *tick*, or *hippobosca ovina*, is extremely injurious to sheep, by making the animal bite and rub itself, so as not only to prove detrimental to the fleece, but to break the skin; in consequence of which, the fly is apt to fix on the wool near the wounded part, and there deposit its eggs. This troublesome animal may be, in a great measure, destroyed by a solution of white arsenic in powder, made in boiling water, in the proportion of an ounce to a gallon, and poured, when cold, on the back of the sheep, and allowing it to diffuse itself down the skin on each side; in this method, however, several of the ticks escape by crawling to the extremities of the filaments. It will be still better to wash the lambs in the autumn, whether shorn or not, in a tub of a similar mixture. For this purpose, three pounds of the same arsenic in powder, may be dissolved in six gallons of boiling water, and the solution mixed with forty gallons of cold water. The whole being, then, well stirred with a stick, the lambs may be plunged into it, great care being taken that they do not dip their heads, or taste the water. The liquor must be squeezed out of their fleeces back into the vessel, in order that it may not be wasted. It is hardly necessary to point out the poisonous quality of this liquid, and how important it is to keep the vessel locked up, and, after the operations are performed, to clean it well; or rather never to use it for any other purpose; and to throw the liquid which remains, where not the smallest quantity of it can be drank by any creature whose life we value. Infusion of tobacco is equally effective, but not so economical.

When the lamb is fairly on its legs, and able to do something for itself, it is frequently the case, that a pasture is chosen for the dam, as uncongenial for the production of milk, as it is unfit for teaching the offspring to feed, which thus prolongs the dependence of the latter on the lacteal supplies which it must draw from the mother. When the vegetable food which the lamb consumes becomes increased, the milk of the dam diminishes; and, either from natural constitution, or from some accident, it frequently happens that she becomes dry, notwithstanding the efforts of the lamb to preserve

the lactiferous stream. When this is the case, the lambs are often depastured on over-eaten seed; and as their bowels are tender, and not yet inured to such food, they become affected with purging, and hence the cause of unweaned lambs being afflicted with the scour, when unavailing recourse is had to the shears and medicine, to save lives which too often pass beyond the reach of skill. The discovery is then made that the lambs have been so weaned, and have had improper pasture Once place weaned lambs on over-eaten seeds, and the whole flock takes the scour, followed by flies, maggots, medicine, and death. To prevent such a calamity, Mr. Milburn recommends a hard old grass, or a second crop of mown clover, which he considers perfectly safe. "It is not the excellence of the pasture," he says, "as regards its quantity, which is to be feared, but the quality; for if the land be rich, with grass and newly-grown seeds, the scour is certain to follow. Some flock-masters, who have not red clover, or poor grass land, will send their lambs to a poorer soil to graze, until their bowels have become accustomed to purely vegetable diet. Should scour take place, it is often difficult to stop it. The bowels must be relieved of the dry food, and the system hardened by tonics. A dose of a quarter of an ounce of flower of sulphur, in old milk, will generally succeed in stopping the disease, if it be properly attacked in its early stages."

"It is an excellent plan," the same practical gentleman further remarks, "to have a few wethers, or barren ewes, to put in the field with the lambs after weaning. They teach them to select their food; they draw out the instincts of the young lambs, and materially assist in drawing and training. A pen should be provided in the corner of the field; and to dip as soon as possible after weaning is by no means a bad practice. As soon as the ewes are shorn, and before the weaning, it is very desirable to have the lambs dipped. If deferred till after weaning, there is often much fretting excited in them, and they seem to suffer more by far than when they are subjected to the process during the period when they are remaining with their dams. It is often necessary again to dress the lambs in the autumn, and so keep them from the annoying and irritating effects of insects which seem to grow upon them, despite every care, unless they are subjected to frequent remedial applications. If sale at one year old is intended, the lambs should be kept on artificial food, from the very season of weaning, in order that they may be well brought up."

CHAPTER VI.

THE MANAGEMENT AND FATTENING OF SHEEP.

Before directly considering the methods pursued in the management and fattening of sheep, the construction and power of the digestive organs of the animal, upon which experiments are to be tried, should be well known. These in the sheep, like those of almost all vegetable feeding animals, are extremely complicated; and, in the exercise of their functions, accomplish a much more difficult task than those which are possessed by animals that principally feed upon flesh. The food of these, before it is eaten, is in a great measure ready prepared. The constituent parts of which it is composed have a close resemblance to those of the blood itself, and necessarily have an exact similarity to the very flesh it is intended to nourish. This being the case, a much smaller quantity is required to sustain the body, as there is little of it given off in the way of waste, or ejected in the form of fœces. This, however, is very different from what is necessary to sustain the body of the herbivorous quadruped. The food required for it has to be sought in the wilds of nature, in the fields and

the forest, where it is found in the very crudest state, and requires to be consumed in large quantities, in order to yield a sufficiency of nourishment for the sustainment of life. This, as a matter of course, necessitates a difference of construction in those internal organs which have to act upon such a bulky species of nutriment. Accordingly, the digestive organs of the graminivorous animals are much more extensive than those of the carnivorous, and proportionally more complicated, that they may be equal to the performance of their work. Both the ox and the sheep have very extensive digestive organs. Their intestines are of great length; and, in place of having only one stomach, like the horse, they have no fewer than four. "The usual course of the food," says Professor Spooner, "is into the *rumen*, or *first* stomach, whose entrance is close to the termination of the œsophagus and the entrance of the canal. This stomach is of enormous extent, occupying, indeed, when full, nearly three-fourths of the abdomen. It lies towards the left side, extending to the flank; and, by a sort of muscular band, it is partially divided into two principal compartments. It is lined internally by the peretonial membrane, in common with the other contents of the abdomen, and, internally, by an insensible membrane, called the cuticular, between which there are two other coats—the mucus, which secretes the fluid found in the stomach; and, external to this, the muscular coat, which is formed of two orders of fibres running in opposite directions. Its interior aspect presents a number of pouches or compartments, which are formed by muscular bands, thrown across from one part to another; and the surface presents an innumerable number of pupillæ, or eminences, not sharp, but blunt pointed, which are formed by the mucus coat, and merely covered by the cuticular. These pupillæ are coarser in the lower compartment of the viscus than in the upper. We have said the rumen consists of two compartments; but, with greater propriety, it may be stated, that there are three; a smaller one being situated immediately below the termination of the œsophagus, and adjoining the second stomach. The use of these partial divisions is very evident. They relieve one portion of the stomach from sustaining the whole of the weight of the food; and they afford a sort of steps, or resting-places for the food that has undergone maceration, the upper, and smaller, compartment being that into which the food is raised just previous to being ruminated. The rumen is partly attached to the second stomach, but only communicates with it through the common opening into the œsophagean canal. The *second* stomach is called the *reticulum;* its size is considerably less than the rumen, but it possesses much strength in its coats, and its muscular fibres are more developed. It is globular in shape, and somewhat larger than the maniplus, and is familiar to us in tripe, not only from its cellular structure, but from its being thicker than the others. Its internal aspect is very singular, having a vast number—indeed, several hundreds—of shallow cells, somewhat like a honey-comb. The cells are much smaller at the part of the viscus nearest the entrance, and gradually increase in size from this point. The sides of these cells consist of ridges formed by the mucus and cuticular coats, and smaller ridges are also observed, running across within the cells. Most of them are pentagonal, but many have six sides; and, on their surface, we observe an immense number of sharp-pointed pupillæ, much smaller in size, though sharper than those of the rumen, and which secrete a mucous fluid. This viscus has the same coats as the rumen, but the muscular coat has two layers of strong fibres, arranged both transversely and longitudinally. The opening into this stomach is of some extent, compared to its size; the duplications, or lips, which form it, are, indeed, the floor of the greater portion of the œsophagean canal. Though, in the ordinary state, the root, or upper part of the reticulum, is the floor of the œsophagean canal, yet if air is pumped into the œsophagus, so as to distend the stomachs, the situation of the reticulum will become reversed, rising up towards the œsophagus; and thus, if this rexius is distended in the disease of hoove—as, from its free communication with the rumen, it probably is—it must press on the diaphragm with considerable force, greater in proportion, even, than the rumen itself. The contents of this stomach are more liquid than those of the others. Somewhat before the end of the entrance of the second, the canal terminates, as it were, in the third stomach—the *maniplus*, or *manifold;*

so called from its curious internal structure, which is formed by a great number of plaits, or folds, arranged longitudinally in a direction from the entrance of the stomach; so that, although it is not large externally—not exceeding the reticulum—its external surface is increased in more than a tenfold degree. These plaits are very curiously arranged, being in the form of seven or eight groups of six leaves, each leaf dissimilar in length, the largest extending almost from the upper to the lower part of the stomach. These leaves are studded with numerous small pupillæ, much harder than those of the reticulum, and some on the edges of the plaits, of the shape of a bent cone, the points directed towards the entrance. It has been found, in certain cows that would never retain their food, but were continually scouring, that these plaits were unusually short. The maniplus has but one opening, but this opening is in direct communication with both the canal and the fourth stomach. The plaits are studded with numerous minute pupillæ, somewhat similar to those found in the reticulum. The maniplus possesses four coats like the others, and its external appearance is globular. Its contents are generally found of a much harder consistence than those of the other stomachs. This stomach, when full, is found above the œsophagean canal, forming, indeed, a portion of its roof; and its longest leaves fall down, as it were, almost into the canal. The *abomasum*, as the *fourth* stomach is called, is, in fact, the true stomach, being that which secretes the gastric juice, by which the food is converted into chyme. It is this peculiar acid which gives it the power of coagulating milk; and, in calves, it is particularly employed for this purpose in the manufacture of cheese, under the term *rennet*. Externally, this organ is somewhat conical in shape, its apex being the part which joins the intestines. It possesses three coats, like the other stomachs, but its internal surface is very different, being smooth and shining, and of a pale-red colour. Its mucous membrane is, indeed, very vascular, and this secretes the gastric juice. The internal surface is greatly increased, and exceeds the external, by being in the form of plaits, arranged longitudinally, but very different from those found in the maniplus. The entrance to this stomach (its cardiac opening) is close to the entrance of the maniplus; it is arranged in a somewhat crescentic form, and is situated at one extremity of the base; whilst the pyloric opening, backing into the small intestine, is, as before observed, situated at the apex. Such is the situation and appearance of the stomachs; and we deem it unnecessary to follow the course of the food through them.

"To meet the necessity of all these stomachs in the sheep, we all know that a certain quantity of food is required, that the animal may not only be preserved in health, but be kept alive. This quantity is designated its necessary ration of food; and if it is given more after it has consumed this portion, it will grow in flesh, or yield milk, or wool. When an animal is growing, whether of the human or any other species, it should never be stinted in its food. Keep the stomachs of babies and puppies full, and there will be comparatively little crying in the one, or whining in the other. Stint them, however—never let them feel themselves full, and they will necessarily make known their dissatisfaction. It has been found that an ox requires two per cent. of his living weight in hay per day; if he works, he requires one-half per cent. more. A milch cow requires three per cent.; and a fatting ox five per cent.—four-and-a-half when half fat, and only four when fat. Grown sheep take three-and-a-half per cent. of their weight in hay per day, in order to be kept in store condition."

Mr. Richardson, in his treatise on the Sheep, supposes a farmer purchasing a score of the Leicester and Cheviot hogs at the same period, and feeding them for the same length of time on the same food; when the results would be something like the following:—

	£	s.	d.	£	s.	d.
20 Leicester hogs, at 33*s.*, bought in spring				33	0	0
Then say 7 lbs. each of wool, at an average price of 1*s.* 1*d.* per lb., 7*s.* 7*d.* each, or	7	13	8			
Sold off fat, say at Christmas, weighing 24 lbs. per quarter, at 5*d.* per lb.	40	0	0			
				47	13	8
The 20 sheep will leave for food and profit				14	13	8
20 Cheviot hogs, at 20*s.*				20	0	0
Then say 3 lbs. of wool each, at 1*s.* 1*d.*	3	5	0			
Sold off fat, 18 lbs. per quarter, at 6*d.*	36	0	0			
				39	5	0
The sheep will leave for food and profit				19	5	0

As quiet and warmth contribute in a large degree to the fattening of sheep, these should

always be taken into the calculations of the farmer. Their *modus operandi* is simple, and very easily described. Experience has taught us that, as we accelerate our own motion, we increase respiration, when the excess of oxygen inhaled requires an increased quantity of carbon, which would otherwise be given to the accumulating of fat. So, likewise, cold takes away from the system its animal heat; to renew which, more oxygen and more carbon must be employed in producing extra combustion, in order that the diminution of temperature may be restored. Nature effects this restoration of heat, by causing cold to produce both hunger and the desire for motion; supplying carbon by the gratification of the former, and oxygen by the indulgence of the latter. In proof of these facts, the following experiment may be given:—One hundred sheep were put into a shed, and ate 20 lbs. of Swedes each per day; whilst another hundred, in the open air, ate 25 lbs. At the end of a given period, the former weighed 3 lbs. more than the latter; which proves that, to a certain extent, heat, with animals, is a substitute for food. This was also proved in other experiments into which the effects of exercise on the living animal entered. No. 1.—Five sheep were fed in the open air between the 21st of November and the 1st of December. They consumed 90 lbs. of food per day, at a temperature of about 44°. At the end of this time they weighed 2 lbs. less than when first exposed. No. 2.—Five sheep were put under shelter, and permitted to run at a temperature of 49°. They consumed at first 82 lbs., then 70 lbs. per day, and increased in weight 23 lbs. No. 3.—Five sheep were put in the same shed, but not allowed any exercise. They ate, at first, 64 lbs., then 58 lbs., and increased in weight 30 lbs. No. 4.—Five sheep were kept in the dark, quiet, and covered. They ate 35 lbs. per day, and increased in weight 8 lbs.

Mr. Richardson gives the following experiments bearing closely upon this subject. They were mostly made by Mr. Lawes. That gentleman instituted a series of inquiries as to the abstract food and increase in weight of these sheep in themselves, and also as compared with the Hampshire Downs, assuming the Sussex Down to be the type of the original Southdown sheep. One disadvantage was, that they had to be fed on dry food; they had oil-cake and clover chaff. At first they had food supplied in given quantities, and proportioned to their weight. The quantity given, per day, to the Hampshires was one pound of each; while to the Sussex Downs it was only three-fourths of a pound of each per day The former weighed 113½ lbs., and the latter only 88 lbs. Swedes were also given *ad libitum*, but from quantities previously weighed. The sheep were fed for twenty-six weeks. The Hampshires consumed 1,249 lbs. of oil-cake, 1,120 lbs. of clover hay, and 16,995 lbs. of Swedes; and the increase of live weight was 428 lbs. So much for the large sheep. The smaller, or Sussex Downs, in fact, consumed 965 lbs. of oil-cake, 926 lbs. of clover hay, and 12,445 lbs. of Swedes, and gave an increase, in live weight, of 324 lbs. To put it in a more striking light, it required, to produce 100 lbs. increase in live weight, the following quantities of each kind of food in the Hampshires:—

	lbs.	oz.
Oil-cake	294	0
Clover hay	259	12
Swedes	3941	0
Or a total of food of all kinds .	4494	12

Whereas the Sussex sheep required, to produce 100 lbs. live weight, the following quantities:—

	lbs.	oz.
Oil-cake	314	4
Clover hay	304	3
Swedes	4086	0
Or a total of food of all kinds .	4704	7

The Sussex sheep needed, therefore, in twenty-six weeks, 20 lbs. 4 oz. more oil-cake, 44 lbs. 7 oz. more clover hay, and 145 lbs. less Swedes, to produce 100 lbs. live weight; or about 7 per cent. more oil-cake, 17¼ per cent. more clover, and 3½ per cent. more Swedish turnips, for the same result. The taste indicated a difference in the animals: the Sussex sold at about 3*s.* 2*d.* per stone of 8 lbs.; the Hampshire only 2*s.* 10½*d.* per stone; and after paying their way, and allowing for the purchased food—the cake and hay—the forty Hampshire sheep left a profit, as well as the increase, of 6*s.* 7½*d.*, and the Sussex, of 6*s.* 0½*d.* per head. The oil-cake is, however, reckoned at only £6 15*s.* per ton, and the clover hay at

£4 per ton. Nothing is charged for attendance.

As far, therefore, as this was a paying speculation, neither seemed to answer. The Swedes, the attendance, the washing, shearing, and other *et-ceteras*, would diminish the profit to less than *nil*; but this was hardly the object of Mr. Lawes. The forty Hampshires consumed 49¾ tons of Swedes, and the Sussex only 36⅘. The latter were, however, much the smaller, and more would be consumed to the acre. Mr. Lawes himself, however, puts the case in another light. He says—Suppose, then, that in both cases 100 tons of Swedes had been eaten, we should have had consumed with them, and paid for by the increase of the animal—

	Oil cake, lbs.	Clover, lbs.
By the Sussex sheep . .	17,374 and	16,676
By the Hampshire . . .	16,470 and	14,767
	904	1,909

That is to say, in consuming 100 tons of Swedes (and the dry foods), Sussex sheep would, according to our experiments, have given the increase from 904 lbs. more oil-cake, and 1,909 more clover, than the Hampshires. To have consumed the quantities of food supposed above, however, in twenty-six weeks, there would have been required eighty Hampshire, and about one hundred and ten of the Sussex sheep.

Mr. Lawes subjected the Cotswold to the same course. Having, however, originally intended them for a comparative trial with the New Oxfords, but without success, he tried the fifty sheep alone, on different qualities of food, and subjected them to a comparison (as to their fattening tendency) with the two kinds of Downs he had before tried. He commenced with the flock selected by Mr. Garne, on the 24th of October, and fed them on turnips in the field until the 21st of November, when he put them on boards or rafters, and then fed them on oil-cake, clover-chop, and as many Swedes as they could eat. The same proportion of dry food was allotted to the Cotswold in proportion to their weight, which was 113½ lbs. average per animal. The food at first given was 1 lb. per day each of clover chaff, and the same of oil-cake. Near the conclusion of this experiment the oil-cake was increased by one-half. The average weight, on the 1st of December, was 119 lbs. 14 ozs.; but there was a difference between the greatest weighted animal of 146 lbs., and the smallest, 103 lbs., which showed how vast a variation there may be in a lot pretty nearly equal in appearance. Mr. Vernon Harcourt showed that great differences of produce would take place in the same field in various parts similarly treated; and Mr. Lawes' experiments show the same results. In the first month of the experiment, after the weighing alluded to, the increase was in a margin from *nil* to 22 lbs.; nor could previous weight, or any other element, account for the difference. The weekly average gained, per head, was 3 lbs. 10,⅘ ozs. during the month. In the second month, the extreme variations of increase were 1 lb. against 22 lbs.; but it is very remarkable that it was not the one which had been the greatest gainer the preceding month, or increased the most, nor *vice versâ*. Though it eventually happened, that the one which gained the most was that which realised the greatest amount at the end of the experiment. The average gain in this month was less, being on 3 lbs. 3,⅞ ozs. per head per week. In the third month, the greatest increase was again 22 lbs., and the smallest 3 lbs.; and it is again remarkable, that the one which gave the smallest increase in the second month, was that which progressed the most in the next. The average gain fell, however, to 3 lbs. 6⅝ ozs. per week. In the fourth week, the lowest increase was again 3 lbs., and the highest 28 lbs.; the latter being the one which stood highest in the second month. The average increase was 3 lbs. 5 ozs. per head per week—an increase which shows how much may be gained by judicious management and proper treatment, under the circumstances.

The result of these experiments was, that the final mean weight, without wool, was 174 lbs.; the highest weight, 214 lbs.; and the lowest weight, 147 lbs. The highest average increase, per week, was the one before particularly referred to, which averaged 4 lbs. 7 ozs.; the lowest average being 1 lb. 4 ozs., and the general average 3 lbs. 2½ ozs. The increase in twenty weeks, per 100 lbs. of live weight, took 259 lbs. 11 ozs. of oil-cake, 219 lbs. 1 oz. of clover hay, and 3,608 lbs. of Swedes. Now,

the comparison with the Downs, of the two kinds before referred to, is as follows:—The

	lbs.	ozs.
Cotswold gained, per week . .	3	2½
Hampshire Downs	2	12
Sussex Downs	2	1¾

But there was a difference in the food. The Cotswold consumed more food—more of every kind than the Sussex Downs; and more, though very slightly, of all but the clover hay, than the Hampshires. But then they had a larger frame, and produced greater results. Taking the 100 lbs. increase, for instance, as the test, as it ought to be, the result is, in every way, in favour of the Cotswold; as the following shows:—

	Cotswolds.	Hampshires.	Sussex.
Oil-cake . .	239¾ lbs.	294 lbs.	314 lbs.
Clover hay .	219 „	259 „	304 „
Swedes . .	3601 „	3941 „	4086 „

The increase in weight, per 100 lbs., was about 2 per cent. greater with the Cotswolds.

The "balance-sheet," always so satisfactory, is not here of the same consequence as the experiment. It is not likely, when the animals are so confined and often weighed, that so much can be defined as clearly to make profit a guiding element. The cost of the sheep is given at £66 10*s.*; the quantity of purchased food consumed by oil-cake and clover hay, £29 6*s.* 5½*d.*—a total of £95 16*s.* 5½*d.*; while the proceeds of the sale were £92 3*s.* 7½*d.*; a small difference of £3 12*s.* 10*d.*, in the lot, with the manure, for the risk, return for capital, land crop, and Swedish turnips; but they were sold at a "heavy" market, and this may partly account for the loss. There is one curious fact, in this and the preceding experiments, which we cannot help noticing. Mr. Lawes observes, that there is some general uniformity to be seen in the quantities of food in their fresh state, consumed by all the three kinds of animals, per 100 lbs. live weight weekly. "But when the quantities of the respective foods are calculated, each to their contents of dry substances, it is found that the total quantity consumed to a given weight of animal, within a specified time, is all but absolutely the same for the three breeds."

Fattening sheep, at one year old, should begin to lamb; and not only must artificial food be given to the lambs as soon as they will eat it, but they must be supplied with it indirectly before they begin to partake of it in the milk of the mother. Oat, bean, and linseed cake may, and ought to, be given to the parent animal, so that the offspring may always have plenty of the materials wherewith to form bone and muscle, and even fat. The fattest lamb (other things being equal) not only makes the fattest shearling, but will eat the least amount of food to produce any given amount of mutton. Rape cake is said to lay on mutton very cheaply, and is second only to linseed, whilst its price is one-half less.

When the hogs are weaning, they require clipping, and superior food. For this purpose, different combinations of spirits of tar, arsenic, tobacco water, with a mixture of oil or soft soap, are used in various proportions; but Biggs' or Wilson's composition is recommended as being the best. At this time the lambs should not be placed where sheep have been depastured before. The object of this caution is to prevent the probability of an attack of diarrhœa. The second crop of mown red clover, or the fog of inferior grass land, is by far the best food. Should this, however, not be obtainable, a cattle-eaten pasture, but not of the richest kind, will be the most favourable, and the quantity of food given artificially should be slightly increased. Great care must be taken in confining the young sheep on the turnips. The best mode is gradually to accustom them to the watery and succulent, but very valuable sheep-feeding food. With respect to the most advantageous food to be given to sheep, there is a difference of opinion—some preferring oil-cake, some beans or peas, and others oatmeal or barley-meal. Much, of course, will depend upon the nature of the farm, as it must, to a considerable extent, be preferable to make use of the product of the land. Sheep prefer beans to oats; and beans abound in that principle in which turnips are most deficient. Thus they are, in some measure, well adapted to counterbalance the disadvantages of turnip-feeding; and, as the latter abounds more in the elements of fat, it probably prevents the beans from hardening the flesh too much, which they are apt to do. Barley and oats contain less albumen than beans, and are therefore more fattening. Oil-cake does not yield much nourishment, but possesses

the fattening principle in a concentrated form. Mr. Childers states, that sheep fed with the addition of half a pint of barley per sheep per day, half a pound of linseed cake, a little hay, and with a constant supply of salt, become ready for the butcher in ten weeks; and gain, of flesh and tallow, from thirty-three to forty pounds per head (one sheep gained fifty-five pounds in twelve weeks); and that, with artificial food, thirty tons of turnips will feed sixty sheep; while, on the usual plan of feeding on turnips alone, out of doors, the average of the country is, that twenty tons of turnips will feed, in sixteen weeks, ten sheep, with a gain of only twenty pounds of flesh and tallow. This gentleman long ago established the fact, that house, or shed-feeding, was a great saving of food. Mr. Richardson was staying with him at Cantley during the experiment, which was most carefully conducted by Mr. Childers in every way. The same food was given to each lot—one exposed, and the other sheltered in a walled and well-littered yard: 27 stones of turnips, 10 lbs. of linseed cake for each lot, and half a pint of barley per sheep per day, with a little hay and salt to go to, were given; but soon the sheltered sheep ate less, by 3 stones of turnips per day, than those exposed, and ultimately 2 stones more, as well as 3 lbs. of cakes per day. The result was, that in three months, two field-fed sheep had increased 36 stones 8 lbs., and the shed-fed, 56 stones 6 lbs. —a difference, in twenty sheep, of just 20 stones live weight! This experiment, Mr. Richardson says, gave the example for general imitation, and has divided sheep-feeders into several classes. The field feeder values the consolidation of the animal's kneading, and feeds out of doors. Amateurs, like Mr. Mechi, advocate *board-feeding*, or houses with hollow floors of boards, set on an edge sufficiently near to prevent the sheep's feet from falling through; and one from his Cotswolds may be fat at one year old. As we disapprove of board-feeding, except under very special circumstances—strong clay land, for instance, or some equally potent physical preventive to the feeding out of doors—we think it fair to give the opinion of a gentleman who warmly advocated it—we mean the Hon. Captain Dudley Pelham.

"The sheep," he says, "should be upon gratings, made with oak frames and deal tops, three-quarters of an inch between the bars. Beneath the gratings, which should be supported on either side, without cross-supports (which are inconvenient in emptying the pit), should be a tank or pit in brickwork, or rammed with marl, not less than two-and-a-half to three feet deep, so as to contain all the manure dropped by one lot of fattening sheep; thus avoiding the necessity of disturbing the animals for the removal of the manure." This gentleman recommends gypsum to be thrown over the gratings to prevent unpleasant smells, and that the sheds should be even cooler than those intended for oxen, 45° being the point he considers to be aimed at, while those of oxen he thinks should be 50°. The size of the pens he recommends to be eight feet by six, and to contain six Down sheep. The quantity of food eaten by fifty Down sheep, he estimates at two tons; and sheep in these sheds, he conceives, will feed in about twelve weeks. He has had sheep, for three weeks, increase at the rate of 4½ lbs.; and each animal will make, he calculates, 2 cwt. of powerful solid manure.

Stall-feeding sheep is a step still more in advance even of this; and, though inapplicable to young sheep, is, in some parts, practised with considerable success.

Respecting the *comparative economy of feeding sheep at one or two years of age*, Mr. Richardson made an estimate, which he published in the *Farmers' Magazine*. He showed that, during the two years the two-year-old feeding system was in operation, the produce would be, on thirty acres of land, 7,800 lbs. of mutton; and the same area of land would produce 11,600 lbs., in the same period, by the one-year-old system; thus showing a gain, per annum, of 1,900 lbs. of mutton, on thirty acres of land, to the community. He further calculated the comparative advantage to the feeder; and showed that, with mutton at 6*d.* per lb., the one plan would leave a profit on the two years—out of which the rent was to be paid—of £62 10*s.*; while that of the one-year-old system would leave a profit of but £59 4*s.* The figures and calculations are too extended for us to make use of them; but the change, he says, in the demand for small mutton, since the period when these calculations were published, will somewhat modify the calculation,

and give the turn in favour of the one-year-old system—a course, it will be seen, which is only perfectly right, as more capital would be required in the one-year than in the two-year-old system, however it may otherwise be thought.

CHAPTER VII.

DISEASES OF THE SHEEP, AND THEIR REMEDIES.

In the whole range of domesticated animals, there is none so difficult to manage as the sheep, labouring under a state of disease. In acute cases, the use of remedies seems to be utterly in vain; whilst the power of known remedies seems to have literally no effect whatever in effecting the purpose for which they are administered. This is, perhaps, of less consequence now, seeing that the system of management is so well understood, that the animal is always kept fat and ready for the butcher, in order that, on the first symptom of illness, it may be dispatched before the disease has affected its vitals. Let sturdy, or rot, or inflammation, however, take place, and all the medicines in the world may be administered, and no effect will be produced.

The first ailment—for it cannot be called a disease—of which we will take notice, is that of

PARTURITION.

In this country, the usual time of lambing with the greater number of sheep, is in the months of March and April; but sometimes an earlier period is obtained, for the purpose of having the lambs sooner fattened for the market. Accordingly, the Somerset and Dorset sheep have their lambs dropped generally before Christmas. At this season great care and attention should be given to the ewes, by way of affording them proper food and shelter from those inclemencies of weather which frequently prevail during the earlier months of the year. They should either be driven nightly into yards or cots properly protected, or a shelter should be supplied to them in the fields, by means of double rows of hurdles lined with straw, with a pound or inclosure, which will afford still greater protection. The care of the shepherd should, at this period, be in constant exercise; whilst the eye of the master should be continually on the watch, as a little assistance, opportunely extended to the labouring ewe, might be the means of rescuing her from the dangerous position of a too much exposed situation in reference to life. Mr. Price, in his work on sheep, observes, that many lambs may be lost without its being possible to charge the lamber or shepherd with either ignorance or neglect, although greater attention on his part might have saved many, which otherwise would perish. The practice of lambing is at times very intricate, and is apt to exhaust the patience of a lamber.

Sheep are obstinate; and lambing presents a scene of confusion, disorder, and trouble, which it is the lamber's business to rectify, and for which he ought always to be prepared. Some of the ewes, perhaps, leave their lambs, or they get intermixed; and the ewes that have lost their lambs run about bleating, while others want assistance. These are only a few of the various circumstances which call for the immediate attention of the lamber, and which render it necessary that the owner of the sheep should be on the spot, and should superintend the whole of the operations. The shepherd, however, must not be led to interfere with the ewe prematurely, if she appear to be labouring under great uneasiness and pain. He must watch her closely; and so long as she rises at his approach, he may be assured that, whatever amount of uneasiness she exhibits, still all is going on well. Much pain is apparent, as she will repeatedly lie down, and rise again with seeming distress.

Should this occur whilst he is driving her to fold, he must give her time, and exercise great caution in urging her too fast. Symptoms of this kind ought to be suffered to continue for two or three hours, or even longer, before he feels himself called upon to interfere, unless the lamb is in such a dangerous position as to excite fears of losing it. Protracted labour often occurs in cold weather. On such occasions, should the ewe seem exhausted, and to be gradually sinking under the prolonged severity of her labour, some oatmeal gruel, with a little linseed, in the proportion of a spoonful of the latter to two of the former, should be given her. When the ewe feels that she cannot of herself expel the lamb, she will quietly submit to the interference of the shepherd, and almost look for his assistance. Where this assistance is necessary, the first duty will be to ascertain whether the presentation is natural. When this is the case, the muzzle of the lamb is foremost, with a foot on each side of it. Should this be the presentation, his first business will be to disengage the lamb, by gently drawing down the legs, and, with all possible tenderness, smoothing and accelerating the passing of the head with his fingers, rather than forcibly extricating it —the particular attention of the shepherd being given to these points. This is to be done by passing the finger up the rectum until the back of the lamb's head is felt, which must be urged forward, at the same time that the legs are gently pulled. It sometimes happens that the legs are too backward, whilst the head is sufficiently advanced. In such cases, the head should be gently pushed back, and the hand, being well oiled, that the object may be the more easily effected, must be introduced into the vagina, and applied to the legs, so as to place them in their natural position equal with the head. On the other hand, should the fore feet protrude, they must, in like manner, be returned, and the same assistance given to advance the head. If the hind quarters present themselves first, the hand must be so applied as to get hold of both legs together, and draw them gently, but firmly. In this position the lamb may be often easily removed. It frequently happens that the head of the lamb is much swollen and protruding. Where this is the case, both patience and gentle manipulation will be required to bring it forward by degrees. Nature herself, however, if not unduly interfered with, will, provided the pelvis be not very much deformed, effect her own operation. In case the strength of the mother should be rapidly diminishing, the head may be taken away, and then the operator will be able to push back the lamb and introduce his hand, when, by laying hold of the fore legs, he will effect the delivery. It sometimes happens, however, that the legs are thrust out to the shoulder, when, from the throes of the ewe, it is not possible to replace them so as to raise the head of the lamb; but by partially skinning the legs, they may be separated from the shoulder-joint, when room will be given for the introduction of the hand, and by laying hold of the head the ewe may be delivered. The practice obtained in one season, however, will do more to enable the farmer to act in difficult cases of labour, than all the instructions that can be given in a volume of writing; but, as a general rule, it should be remembered that the fœtus should, if possible, be placed in its natural position previously to any attempt to extricate it by force. When this must be employed, it ought to be in as gentle a manner as can be consistent with the tenderness of the object to be delivered. After parturition, it is hardly necessary to observe that the ewe should be nursed with the greatest care and attention until she has completely recovered. After difficult labour, and where much assistance has been given, the labiæ of the uterus and vagina are sometimes ruptured. In such cases, where there is no other hope, a veterinary surgeon will have to divide the ligatures

When ruptures of the vagina take place, use the following dressing, rudely known as the "Driffield oil," or black oil:—

Take of Olive oil . . .	1 pint.
Spirit of turpentine .	2 ounces.
Sulphuric acid . .	6 drachms.

They are safest mixed in a stone jar, as great heat will be generated during and just after the mixture. When cool, it may be put in a bottle for use.

If an appearance of mortification or gangrene occurs, a more decided application will be necessary, when it is best to call in a veterinary surgeon.

GARGET.

This is an inflammation of the udder, and is a very common, painful, and sometimes fatal disease. It is less frequent in the sheep, however, than in the cow, and may be produced by cold and wet lair, and, it is stated, from the hardness and dryness of the ground, or from constitutional derangement. Warm fomentation in the first stage, and rubbing with marshmallow ointment after each fomentation, with a warm, dry towel, is the best local application; while an internal medicine, composed of—

Three drachms of nitre,
Two of cream of tartar,
Dissolved in four ounces of lukewarm water,

may be given with advantage. The black oils may be used, after the first few days, to promote suppuration of the matter formed in the udder, and, after it breaks, a dressing of tincture of myrrh. An ounce or two of Epsom salts is also recommended to be given to the ewe, with a drachm of ginger dissolved in warm water or gruel, and the udder fomented, for some time, with water as hot as she can bear it. The lamb may afterwards be allowed to suck her. The fomentation, if necessary, should be repeated, and the camphor ointment rubbed in twice a day. If the swelling continue, it should at once be opened, and the discharge of the pus assisted by pressure, and renewed fomentation. Should the wound smell disagreeably in the least degree, it should be syringed with a weak solution of chloride of lime for several days. It sometimes happens that, from the effects of garget, some portions of the udder become hard or schirrous, as it is termed, and, of course, no longer secretes milk. When such is the case, the ewe should invariably be drafted and fattened for the butcher.

PUERPERAL FEVER.

This is not so common in the ewe as it is in the cow. When it does occur, the medicine recommended for acute garget will be found useful, and may in general be given; or the following may be administered:—

Epsom salts	½ oz.
Tincture of opium . . .	1 drachm.
Camphor pulo	½ drachm.

This is recommended by Professor Spooner after *abortion*—a complaint which sometimes attends ewes when kept exclusively on turnips.

CASTRATION.

When this operation is performed on *lambs* about a month old, it is very simple; and, though often executed in a manner somewhat barbarous, it may be more humanely done by a kind of combined knife and forceps, which has been invented for the purpose. In performing the operation, an attendant holds the lamb with a fore and hind leg in each hand, and with the back close to his breast. The operator cuts off the end of the scrotum, presses on the bag till the testicles protrude, and either seizes the testicles with his teeth, one by one, or with the forceps—and no more trouble is necessary than to confine the lamb for a night or two, if the weather be frosty. To accomplish the castration of aged *rams*, however, is a more difficult operation. After ascertaining that there is no rupture, both the testicles, which are very large, are inclosed and held firmly together by iron clams, and the testes are divided in a line with these by the cautery. Other methods are adopted, but this is by far the most popular. Some use two sticks united at one end, into which each testicle is inclosed, the inner part of the sticks being smeared with a solution of sulphate of iron. The other ends of the sticks are then tied, and the testicle cut off. In twelve hours the sticks are removed by cutting the string, and all the vessels are thoroughly cauterised. This mode is a great improvement on the cautery.

ROT.

Bad and unwholesome food is generally believed to be the cause of this disease, especially as it appears to be much more prevalent in wet seasons, when plants, at other periods wholesome, become rank and impregnated with poisonous qualities. Drainage is doing much to banish it from the country; for it is found that the disease is very rare when the sheep are fed on dry, heathy pastures. Therefore, when it makes its appearance, the sheep should be removed as early as possible, either to a salt marsh, or to such pastures as are of the driest description. Salt may be given to

the animals in as large quantities as they will take it with their food; and to this the sulphate of iron may be added. Half a drachm daily for each sheep, with the same quantity of ginger, is recommended to be given in nourishing gruel. During the treatment an aperient should be given once or twice, and it may be composed of one or two ounces of sulphate of magnesia, or a large tablespoonful of common salt dissolved in warm gruel or water. Food of the most nourishing kind should be given; and a pint of beans daily is esteemed an excellent diet, with good hay, or sound pasture. The best preventive of the disease, Mr. Milburn thinks, is an allowance of plenty of dry food, with salt *ad libitum*. He knew a farmer, in Cleveland, who saved his flock of Teeswaters in a rot year, which almost denuded that valley of its sheep, without any other exception than his own flock. They had constant access to the hay-stack, and so were preserved amongst the general ruin. When the rot unhappily sets in, it is by far the best to sell the whole of those which are at all fit for the butcher, for immediate slaughter.

C

SHEEP-POX.

This disease was introduced into this country by the continental sheep. It is very destructive to the flock, and highly injurious to those animals which recover from it. Professor Simonds, of the Veterinary College, London, recently lectured upon it, as his experience has, unfortunately, lately been very great in the treatment of this disease. We find that, before 1847, the malady had never, during the present generation, been observed among the flocks of this kingdom. It had long, however, been prevalent and well known in several of the great sheep districts of the continent. In some localities, the affection was, so to speak, naturalised; in others it had shown itself, from time to time, in wide and disastrous outbreaks. Within historic periods, the disease had probably never appeared among healthy flocks, unless there had been prior communication, immediately or recently, with animals suffering from the affection. One sheep would infect a flock; a flock would infect a district; and in this way the malady would be spread over the area of a vast country. So it had happened once and again in France, Germany, and Central Europe. But while the communication of sick with healthy animals might be said to be an essential element in the propagation of small-pox, yet it was seen that this could not be the sole element. For now the disease had been observed to break out in one or two scattered instances, and then would appear with a malignity which almost set control at defiance. At one time the flocks showed a higher susceptibility to the disease than at another. This consideration entered largely into the question of prevention. "In the case of human small-pox, Professor Simonds observes, "that we possess a simple, efficacious, and an almost harmless means of prevention in vaccination; but it was not so in the case of small-pox in sheep. Vaccination affords them no protection. Where the separation of the affected animals from the healthy ones proved insufficient to stay the disease, there remained only inoculation to be had recourse to. Nothing was more efficacious than this for securing the ultimate welfare of the flock. He could well understand why so great an authority as Dr. Copeland should, on account of the greater protective power of inoculation, express something like a regret that, in this country, it was prohibited for man. Dr. Copeland apparently doubted the greater value of vaccination as a protection against small-pox. Of the justness of this doubt Professor Simonds expressed no opinion; but he thought it well that it should be alluded to at a time when the recent events in Wiltshire had led to so much discussion on the question, and when the fact of the prohibition of inoculation for man had been used as an argument for prohibiting it in the case of sheep. It had been forgotten by the objectors, that, in the case of sheep, we had no option between vaccination and inoculation. Wide and extended experience had shown that vaccination was valueless as a protection against small-pox in sheep. Wider and more extended experience had, on the other hand, shown the great value of inoculation in mitigating the severity of the disease. Small-pox first appeared among the flocks of England in 1847. It was introduced by foreign sheep sold in Smithfield market. The disease spread rapidly, and committed frightful ravages in several counties during the years 1847, '48, '49, and 1850. Since the latter year, the malady had not

been heard of among our flocks until the month of July, 1862, when it broke out at Allington, near Devizes. It soon spread; and neither the shepherds nor the proprietors were satisfied as to its real nature until the aid of Professor Simonds had been sought; and at that time many animals had been lost. The disease quickly spread to neighbouring flocks, and subsequently extended to Berkshire. At the present moment there is good hope—thanks to the preventive measures adopted—that the malady has been stayed in the vicinity where it had first showed itself. As the value of the flocks of this country amounts to many millions sterling, the loss by death, from small-pox, ranges from one-fifth to one-half, or even more, of an infected flock; but this is only one part of the loss which the farmer has to suffer. He has to bear the effects of the disease on the breeding and rearing of lambs, the fattening of stock, &c. In treating for this disease, the advice of an experienced veterinary surgeon should be at once taken.

FOOT-ROT.

This is one of the most obstinate and powerful local diseases to which the sheep is liable, and, if not immediately attended to, is difficult to cure. Should the affected animals not be kept assiduously from the sound, the disease will, for some time, obstinately keep possession of the flock. The infected sheep, therefore, should at first be carefully examined, and all the diseased parts cut completely away. A dressing should then be applied, consisting of—

Corrosive sublimate	1 oz.
Sulphate of iron	1 „
Muriatic acid	1 „
Sulphate of copper	1 „
Coarse turpentine	1 „
Sulphuric acid	1 „
Spirit of turpentine	1 „
Sheep ointment	4 „

This mixture, simple as it is, is sometimes a necessary application. The sound portions of the flock should have all their four feet dressed with tar, and should be kept all night on a floor smeared with quick-lime. As the diseased sheep approach convalescence, they should be carefully watched, and dressed, if required, daily. In the course of 1862, this disease was rather prevalent in the south-eastern districts; and the following practical suggestions may be valuable. Mr. F. C. Waide, an experienced farmer, says—"Take ¼ lb. of alum, and 2 ozs. of blue vitriol; boil them in one pint of water; when quite cold, add ¾ of a pint of aquafortis, and it will be ready for use. It is equally efficacious for the foul in beasts feet." Another cure is suggested by a farmer at Malton:—"With a sharp knife cut away the infected part, and then, with a clean wooden skewer, apply once a day some muriate of antimony. This will stop the disease, and effect a cure. A strong solution of sulphate of copper would answer the purpose, applied with a brush; but it is neither so speedy nor so effectual." An "East Suffolk Farmer" suggests the following, which, he believes, is a certain cure:—"Take sixpennyworth of quicksilver dissolved in sixpennyworth of nitric acid; add the same quantity of good vinegar; pare the horn well; shake the bottle, and apply to the parts affected. One or two applications will be sufficient."

THE SCAB

Is a disease of the skin, arising from the presence of minute insects called *acari*. The German naturalists trace it to the actual fact of the *acarus*, which buries itself in the skin of the animals, and which must be destroyed; and the sooner the better. The following ointment rubbed in, the wool being first shed longitudinally, and at about four inches apart, will often be successful:—

Sand	2 lbs.
Sulphur	1 „
Spirits of tar	½ „

The application of mercurial ointment is another mode of cure. To make it—take from three to five parts of lard, and mix with it one part of strong mercurial ointment; and after parting the wool, rub it into the furrows from the head to the tail, and about four inches apart.—The following is also an effectual ointment:—

Lard or palm oil	2 lbs.
Oil of tar	½ „
Sulphur	1 „

Mix the two latter ingredients gradually together, and then rub down the former with it. Tobacco-water is another remedy, which has been found very effectual.

THE BLIND.

This is a disease of the eye, and soon takes the character of an epidemic. At first it appears in a little inflammation, and then becomes opaque. The animal suffers dreadfully, and is reduced both in frame and condition. Smearing the eye with tar relieves the pain, and abates the inflammation; but it sometimes removes the wool, and causes the animal to look ugly if he is for sale at any early period.

THE STURDY.

This is an incurable disease, arising either from water in the head, hydatids in the brain, or other disease of the latter organ. As the fattest sheep are usually attacked, the animal should at once be sent to be slaughtered, for the mutton is not impaired in the slightest degree. Various modes of treatment have been tried to cure the sturdy, but they have all been, more or less, failures.

DIARRHŒA.

This disease is most frequent in hogs or young sheep, and is often caused by improper as well as by rapid changes of food. It has been said that two teaspoonfuls of sulphur will seldom fail of producing the effect, when administered in gruel in time; but if the first stage is over, it will require more vigorous means. A dose of two ounces of linseed oil, with two grains of opium, to allay the irritation of the bowels, will often answer the purpose; but if the disease should still prevail—

Prepared chalk . . .	1 oz.
Opium.	½ drachm.
Ginger.	3 „
Port wine	2 ozs.

may be given in a gill of gruel with great advantage.

DYSENTERY.

This disease resembles the preceding to some extent, yet is distinguished by other symptoms, which should be well observed. Sir G. Mackenzie thus draws the marks of distinction between them:—

1st. Diarrhœa chiefly attacks hogs and two-year-old sheep; whereas dysentery is frequent among such as are older.

2nd. Diarrhœa almost always occurs in the spring, and ceases about June, when dysentery only commences.

3rd. In diarrhœa there is no fever or pain before the stools, as in dysentery.

4th. In diarrhœa the fœces are loose; but, in other respects, natural, without any blood or slime; whereas, in dysentery, the fœces consist of hard lumps, passed occasionally, the rest being blood or slime.

5th. There is not the degree of bad smell in the excrement, in diarrhœa, which takes place in dysentery.

6th. In dysentery the appetite is totally gone; in diarrhœa it is rather sharper than usual.

7th. Diarrhœa is not contagious; dysentery is highly so.

8th. In dysentery the animal wastes rapidly; but, by diarrhœa, only a temporary stop is put to its thriving, after which it makes rapid advances to strength and vigour.

9th. Dysentery is commonly fatal; diarrhœa rarely, unless the animal has been previously much debilitated. In cases of dysentery, the following treatment is as good as can be advised, provided proper care is bestowed upon the animal, and the food attended to:—

Linseed oil	2 ozs.
Powdered opium . . .	2 grains.

This is to be given to each sheep, in an infusion of linseed, the gruel being repeated several times; and, on the following day, the opium to be again administered with half a drachm of powdered ginger, and the same quantity of gentian. This may be given several times, and sometimes combined with linseed oil.

These are the principal diseases of the sheep. Those which refer to inflammations of the chest, bowels, &c., require the treatment of a skilful veterinary practitioner, whose services should be sought as early as possible; for the longer the delay, the greater is the danger of fatal consequences being the result. This ought always to be borne in mind in such cases.

MEDICINES USED IN THE TREATMENT OF DISEASES IN SHEEP.

ALOES. Used as a tincture to stimulate wounds. It should not be given internally to the sheep, because of the danger which attends it.

ALUM. Used externally, in the form of a lotion; applied to several diseases of the mouth; and, mixed with chalk, it makes an excellent external application to sores. As an astringent, it is inferior to other medicines used as such; but when given, the dose is half a drachm, with gruel.

ANTIMONY, BUTYR, OR CHLORIDE OF. This is an admirable caustic for foot-rot and other diseases, and should be applied with a feather.

ARSENIC. This is sometimes employed as an infusion, in which the sheep are dipped, for the purpose of destroying ticks and other insects. Great caution, however, should be used with it; and all vessels into which it has been put, should be immediately cleaned after using them.

CAMPHOR. Used with oil or spirits of wine, camphor is employed as an external stimulant. When used internally it acts as a narcotic, sedative, and anti-spasmodic. The dose is from one scruple to a drachm.

CANTHARIDES, OR SPANISH FLIES. This is rarely employed in the diseases of the sheep, except in the form of blisters, in which it makes the chief ingredient.

CARAWAY-SEEDS. A stomachic, in which the dose is from two to four drachms.

CATECHU. Given with opium and chalk in case of diarrhœa. The dose is from half a drachm to a drachm.

CHALK, PREPARED. Used as an external application to wounds and sores; also as a mild astringent in diarrhœa. In such case the dose is from half an ounce to an ounce.

COPPER, SULPHATE OF, OR BLUE VITRIOL. Externally, this acts as a mild caustic; internally, as a tonic. The dose is half a drachm.

CORROSIVE SUBLIMATE, OR BICHLORIDE OF MERCURY. This requires to be very cautiously used. It is employed as a strong caustic and poison in cases of scale, and to kill vermin.

CASTOR SEEDS, OR OIL. A powerful purgative, useful in cases of severe costiveness. The dose is from five to fifteen drops of the oil.

DIGITALIS, OR FOXGLOVE. Used as a sedative to diminish the rapidity of action in the heart. The dose is one scruple.

EPSOM SALTS, OR SULPHATE OF MAGNESIA. An excellent purgative, given in doses of from one to two ounces, or more, dissolved in warm-water gruel.

GENTIAN. A vegetable tonic of great usefulness, administered in doses of from one to three drachms.

GINGER. Used as a cordial and stomachic, usually with aperient medicine. Dose, from half a drachm to three drachms.

HARTSHORN, SPIRITS OF. Used as a stimulant and anti-spasmodic in cases of hoove. The dose is two drachms, in six ounces of water or gruel.

IODINE. A powerful stimulant to the absorbent vessels. It is used both internally and externally, and exercises great influence over glandular swellings. As an external application, it is generally used in the form of iodide of mercury, mixed with eight parts of lard. In the form of iodide of potassium, it is used internally, in doses of from four to six grains.

LAUDANUM, OR OPIUM. A sedative and anti-spasmodic, used either in the form of a powder or a gum: the dose is ten grains. When given in the form of tincture of opium, or laudanum, the dose is from one to two drachms.

LEAD—ACETATE OF SUGAR OF LEAD. A common ingredient in cooling lotions. Used in the form of Goulard's extract.

LEAD, WHITE. A useful application for the prevention of the fly.

LIME, CHLORIDE OF. Useful as a preventive of infection, and also an excellent application to foul wounds and ulcers.

LINSEED OIL. A useful and safe purgative. Dose, two ounces.

MURIATIC ACID, OR SPIRIT OF SALT. Useful in foot-rot, as a powerful caustic.

NITRATE OF POTASH, NITRE, OR SALTPETRE. A diuretic. Dose, two drachms.

OLIVE, OR SWEET OIL. A laxative, but less valuable than linseed oil. As an external application, it is useful in cases of burns and bites from venomous insects.

PIMENTO, OR ALLSPICE. A cordial and stomachic. Dose, from one to two drachms.

RYE, SPURRED, OR ERGOT OF RYE. A strong stimulus to the uterus, given in cases of protracted lambing. The dose is a scruple, infused in hot water; to be repeated, if necessary, in the course of one or two hours.

SALT, OR MURIATE OF SODA. In small doses, a stomachic and tonic. In large, a purgative. When given in moderate quantities it is useful to the health of sheep. For counteracting and curing the rot it is very effective. As a purgative, the dose is about an ounce.

SPIRIT OF NITROUS ETHER, OR SWEET SPIRIT OF NITRE. An anti-spasmodic or stimulant. Dose, two drachms.

SULPHATE OF IRON, OR GREEN VITRIOL. Used as a tonic. Dose, a drachm mixed with ginger.

SULPHATE OF COPPER, OR BLUE VITRIOL. A strong tonic, but rarely given to the sheep. Dose, one scruple. As an astringent lotion it is excellent, infused in hot water.

SULPHUR is a well-known substance, sold in the form of a powder or in solid pieces, when it is called brimstone. It is procured in the neighbourhood of volcanoes. In the tract of land between Naples and the ancient Baiæ, called Solfa-terra —the smoking plains, the remnant of a half-extinguished volcano—it is found in great abundance; and is also brought in large quantities to this country from Mount Etna, in Sicily; but is to be had, in greater or less quantities, near all volcanoes, of which the number throughout the world is very great. It is often found in coal mines; and, indeed, the common coal in our fires, more or less, contains this mineral; which is frequently combined with iron, copper, and other metals, when it is called pyrites.

SULPHURETS are combinations of alkalies or metals with sulphur.

SULPHURIC ETHER. A strong stimulant, and anti-spasmodic. Dose, with warm water, one drachm.

SULPHURIC ACID, OR OIL OF VITRIOL, is generally procured by burning a mixture of sulphur and nitre in chambers lined with lead. It is a liquid, somewhat of an oily consistence, transparent, and colourless as water, without any smell, and of a very strong acid taste. When applied to animal or vegetable substances, it very soon destroys their texture. It may be procured by the following process:—Put into a glass retort two parts of sulphuric acid and one part of mercury, and apply the heat of a lamp; the mixture effervesces; and a gas issuing from the beak of the retort, may be received in glass jars filled with mercury, and standing in a mercurial trough. This gas is sulphurous acid. It is a very strong caustic, and is used in cases of foot-rot, either alone, or combined with tar.

SULPHUR, SUBLIMED, OR FLOWER OF SULPHUR. Given with Epsom salts, as an aperient. Dose, from one to two ounces. In the form of an ointment it is used externally for the scale.

SULPHUR VERUM. This is cheaper, but not so pure as the yellow sulphur. It is of a grey colour, and is only used as an external application.

TAR. Applied to the feet in cases bordering on foot-rot; it is combined with sulphur, acid, or other caustics.—OIL OF SPIRIT OF TAR is used for the same purpose. It is also used for wounds in the skin, and also for the fly.

TURPENTINE. The common is used in digestive ointments, but is not given to the sheep internally. Venus turpentine is pure, and more expensive.—Oil, or spirit of turpentine, is given as a powerful anti-spasmodic and stimulant, in doses of one drachm.

DIVISION VI.

PIGS.

CHAPTER I.

THE ORIGIN OF THE DOMESTICATED PIG.

The hog family is a genus of *pachydermatous mammalia*, exhibiting strongly-marked differences, in most of their characteristics, from the rest of that very singular class. Like all the ruminating animals, they have cloven feet, or only two fully developed toes; and they are the only *pachydermata* which do not entirely confine themselves to vegetable food. The others are exclusively vegetarians, principally subsisting on strong and harsh vegetation; though most of them would give the preference to a more delicate food, if they could obtain it. Hogs are omnivorous, but chiefly vegetable in their feeding, and they prefer such as are succulent, especially wild fruits and roots; though, when other food fails, they can subsist upon almost any kind of digestible matter that falls in their way.

All naturalists admit that the wild hog is the origin of our domestic race; but at what period it was reclaimed is very uncertain. The circumstances, indeed, connected with the domestication of every animal subject to the bondage of man, are enveloped in obscurity. The domestication, however, of the wild hog would not involve much difficulty. Young animals, taken in their native forest, soon become reconciled to captivity, and display the same contentment and familiarity which are so conspicuous in the ordinary tame beast. It is this disposition—a characteristic of the *pachydermata*—which renders the elephant, the rhinoceros, the tapir, and others, so easily subjugated; but, on the other hand, the readiness with which they submit to the restraints of captivity, is counterbalanced by an equal readiness to assume a life of independence. The hog, when left to itself, resumes its original habits—as is the case in America, where wild herds roam the forest; and, as we are told, the elephant often escapes its trammels, and joins its wild brethren; but immediately submits, if retaken, to the voice of authority which it had previously learned to obey. The horse, in a wild state, scours the plains of Tartary and South America, and it requires but a brief struggle to break-in the most spirited. It may be laid down as an axiom, that the animals of the services of which man stands most in need, are, each in their way, those whose nature most readily induces them to submit to his dominion—nay, even to court his friendship. Some can be tamed, and only tamed; others can be educated.

The skull of the hog affords an index of the habits of the animal, and is of a conical or wedge-like form. The base, or occipital portion, forms a right angle with the oblique upper surface, and a bold transverse ridge is formed by the union of the occipital and parietal bones. The nasal bones are prolonged nearly to the end of the snout, which, in the living animal, terminates in a movable cartilaginous disc, pierced by the nostrils. The lower jaw is of great strength. The dentition consists of—incisors, $\frac{6}{6}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{7-7}{7-7}$ = 44. The canines of the upper jaw are prismatic, and curve downwards, having their anterior surface worn by the action of the huge canines of the lower jaw, which are sharp, sweeping out from the sides of the mouth, and often attaining to the length of eight or ten inches, and sometimes even more. These canines, or

tusks, are terrible weapons: rushing on his antagonist, the boar strikes obliquely upwards, right and left, with prodigious force—a mode of action the best calculated for bringing these weapons into effective play, and in which the muscular powers of the neck and shoulders are the most advantageously and naturally exerted.

The hog is found in both continents; but the American animals are so different from those of the eastern continent, that they require to be separated as a distinct sub-genus. They are much smaller than those of the east, but less useful, and more limited in their distribution, being met with only in the humid woods of the central parts of South America, to the eastward of the Andes. In some parts of these woods, however, they are very numerous. In every part of the globe they delight in humid localities, reposing in the sun by the margins of pools and streams, wandering amongst mud or mire; or, in the absence of anything better, basking by the side of some soft dung-heap. They are much more extensively distributed in the east than in the west—in Asia than in America; but it is in the damp forests of tropical countries where they most abound. In some of the more central parts, and in the south of Europe, they are plentiful, but not so extensively distributed as they once seem to have been. In Britain the wild race is extinct; but tradition has handed down to us records of their having, at one period, abounded. In the remote islands of the Pacific they are still general; whilst, in the more densely wooded portions of Africa, and south-eastern Asia, they are to be found in large herds. In some parts, however, there is considerable difficulty in distinguishing between the wood hog, which is the native, or aboriginal, and such as have been introduced from other countries, and naturalised in their new regions; as these, having been turned loose into the woods, have multiplied, assumed the habits of the wild species, and proportionately lost many of their own original characteristics.

In no essential point does the wild race of Europe differ from our domestic breeds, saving that the snout is more elongated, and, as might be expected, the contour of the frame is more gaunt and bony. The ears are short and erect, the tusks large, and the bristles long and coarse; the general colour is rusty-black, or blackish brown, more or less brindled in patches. After the age of three years the wild boar leads a solitary life in the forest, fearless of every foe, and confident in his weapons, which, added to his great strength, render him a formidable antagonist. It is not, however, until the age of five or six years that he attains to his full dimensions, and the duration of his life is from twenty-five to thirty years. The females, with their young, associate in herds, for the sake of mutual protection. On the approach of an enemy the young are placed in the centre, the old ones forming a circle round them; and should he be hazardous enough to venture on the attack, he meets with a rough reception. It is thus that the young are preserved from wolves, the chief foes to be dreaded by them; to which, in some districts, they often fall a prey, notwithstanding the vigilance of their parent. It is only in defence of their offspring that the females are furious; but the old males are not to be approached without caution, and often rush out upon those who venture near the precincts of their lair. At certain seasons, indeed, the wild boar is very savage; and should he meet a rival, the most sanguinary combat ensues. The wild boar of Europe is now, however, by no means the terrible animal he once was; nor is he hunted in the German forests in the same brave and adventurous spirit which, in former ages, mark the spirit of the Teutons. This is evidenced by the present style of hunting the boar in Germany, where he still roams in freedom, and where he is still hunted, but in a manner which appears to us very unsportsmanlike. As a proof of this, we will describe the manner in which his serene highness of Coburg enjoys the sport.

About four miles from Coburg, and a little to the westward of Rosenau, rise several abrupt hills, clothed to the summits with pine woods, altogether occupying a space of a thousand acres. These are the boar preserves of his highness; and having been honoured by a visit from her most gracious majesty Queen Victoria, they had earned for themselves an extraordinary *prestige*. The person who describes this scene was directed to be in attendance on the chamberlain of the hogs at five o'clock precisely; and exactly at that hour, as he made across certain fields of flax lying

between the woods and the high road, that functionary appeared, emerging from his pig *penetralia*. He went about the ceremonial in which he was engaged, quite according to the craft or etiquette of his order. The narrator was requested to approach the preserve with gravity and decorous legerity of foot. Onwards he went, treading lightly, till he arrived at a sort of park-paling inclosure, some six feet high, and closely boarded. Entering there by a gate, which closed behind him, he was shown by an ancient forester, with a mortal blunderbuss on his shoulder, and a rapier by his side, into a thing like a cockney summer-house upon stilts. Within this he was shut up among much musty hay, there being a party of ten in a room suitable only for two. On each of the four sides of the square box were peep-holes, through which these anxiously watched the process of strewing around provisions of corn and potatoes, that savoured very much of the board frugal housewives at home spread for their domestic circle of bacon. Long and fearfully they waited for the guests. Sometimes the master of the ceremonies hinted that perhaps they might not come at all; and when some of the musty hay-dust elicited a sneeze from one of the party, he said he almost despaired of an arrival. But they were not destined to be so disappointed. At the end of an hour, spent about as agreeably as it would be in the black hole of Calcutta, a *vidette* at the peep-holes cautiously gave the words, "Here they come!" And sure enough there they did come, as orderly and well-behaved as if they had been borne in, in rashers, and ornamented with poached eggs. First marched a matron of the sty, accompanied by a very numerous family—quaint little roasters—like nothing in zoology so much as hedgehogs upon a large scale. Anon, through all the loopholes opened for their admission, trooped boars, singly, and in parties; but save an occasional poke in the spare ribs, given by the snake-like snout of some bully to a more gently-disposed sow (the ladies were the most quarrelsome), all went off very tamely. Thus did the feast proceed till the potatoes and corn were consumed, or so much of them as these ravenous creatures were disposed to discuss; for all went to their afternoon meal as gingerly as a Paris *elegante*.

The wild boars of Germany have, indeed, the characteristics of a race not exactly bred to pass from their nurses into sausages. They give you the idea of a cross between the wolf and domestic swine, but retain, apparently, no trace of their savage origin, except a look of cunning, and an apparent instinct of misanthropy. The least move made by the cooped-up witnesses of this scene, was instantly detected and acknowledged; but that was all. The herd made no manifestation of fight. They are as unpoetic and unvalorous a race as those that frequent the trough of the English farmer—at least, those that were there—and their hunting offers no features of enterprise beyond the slaying of pigeons at the Red House. When a boar is to be shot, the herd is enticed to dinner in the inclosure already spoken of. Then, all but the devoted one being scared away, the trap-door of the loop-holes are closed, and the sportsman, ascending a sort of box—like the distance-chair of our English race-courses—quietly administers a leaden pill to his patient. The reigning duke, though keeping up a herd of nearly two thousand, kills a vast number this way every season—such is the degeneracy of European wild hog shooting: no horse-riding, no spear-pointing, no dog-barking; nothing to give the excitement of sport; not even the smallest danger, which we take to be one of the grandest elements that enter into the pleasures of hunting this once formidable animal.

An old French newspaper furnishes an account of an extraordinary boar killed near Cognac, in Angoumois. He had been frequently hunted, but unsuccessfully. His prodigious strength and powers of endurance carried him, on all occasions, safely through the various dangers to which his notoriety had, from time to time, exposed him. He had killed many valuable horses and dogs, and had maimed, as well as destroyed, several men. When at last victimised, several bullets, received during previous conflicts, were found between the skin and the flesh. This animal is described by Sonnini, who does not give his exact measurement, but says that his size was immense. He had a very long head, an elongated and sharp snout, and a terrific mouth, armed with tusks of unusual magnitude and singular shape. The hair on his body was

white; that on the head yellowish; and on the neck he had a black band; the ears were very large and straight. Notwithstanding the prodigious bulk of this formidable and ferocious brute, it is stated that he displayed great swiftness.

Boar-hunting in India still forms a favourite amusement to those who delight in the excitement incident to such diversion. The animal is usually hunted with Arabian horses; the swiftness of which, and their well-known tractability, render them well adapted for this kind of sport. When the boar is just started, he sets off at a slow trot at first; but this is soon quickened into a sort of shambling gallop, keeping his eyes well *behind* upon his pursuers. The pace now becomes exceedingly swift, and he can only be taken by being run down. After running three miles he frequently makes his escape, and will sometimes run even and even without suffering himself to become a victim. The usual height of this animal is about three feet; but some of them reach a few inches over that. The young of the Indian boar are of a palish yellow hue, irregularly marked with yellowish brown. From a remote period, hunting the wild boar has been a favourite amusement with those who delight in manly exercises, and have nerve sufficient to confront danger even when it glares from the eyes of a hard-pressed and infuriated animal, capable, by his strength, of bringing a horse to the ground, and, with a single rip of his tusks, depriving it of life.

In the month of December or January, each male attaches himself to the society of a chosen female, which he accompanies in the deepest glens of the forest for about thirty days. When about to produce her young, the female seeks some undisturbed retreat, remote from the haunts of the male, which, it appears, exhibits a propensity to devour her progeny if he discover the litter. To her young the female is a most attentive mother. She suckles them for three or four months, and they remain with her for a long time. An aged female is sometimes seen followed by several families, among which are some of the age of two or three years. These young rovers are called, by the French hunters, *bêtes de compagnie*. The wild boar seldom stirs from his lair during the day, and may, therefore, be regarded as, in some degree, nocturnal. On the approach of twilight, he rouses from his indolent slumbers, and sets out in quest of food, which consists of acorns, beech-mast, grass, different vegetables, and roots. In search of the latter, he ploughs up the ground with his snout. Corn-fields in the vicinity of forests, where wild hogs exist, often suffer extensively from their nightly incursions. The wild boar, though not truly carnivorous, does not refuse animal matters which chance may throw in his way. He does not, however, ordinarily attack and kill others for the sake of their flesh, but only devours what he may meet with in his rambles. In the morning he returns to his lair, which is generally in the thickest and most gloomy part of the forest, under a rock, in a cave, or under the canopy of gnarled and intertwined branches. When roused by the hunter and his dogs, the old boar retreats sullenly and slowly, gnashing his teeth, foaming with anger, and frequently stopping to receive his pursuers, on whom he often rushes with sudden impetuosity, striking with his tusks, goring dogs and men, and scattering terror around. When he turns upon a pack, the foremost dogs are sure to suffer, and several will fall by as many strokes. An instance is on record in which a boar turned suddenly upon a pack of fifty dogs which pursued him, and instantly dispatched six or seven of them, wounding all the rest with the exception of ten. The young boar is less resolute than the old, and will run to a considerable distance before he is brought to bay; nor is the assault attended with any great degree of danger.

We have said that, from a remote period, boar-hunting has been a favourite diversion; and we find the writings of the Greek and Roman classics abounding with allusions to it, and the great risks which men run in its pursuit. Ovid gives a spirited account of the chase, in which the fury and strength of the enraged beast are admirably depicted. It would seem that the ancients endeavoured to enclose the boar by nets, so as to prevent his escaping into the recesses of the forest. The combat being close, it was necessarily dangerous. Driven from his lair by the dogs, and hemmed in, the infuriated animal turned savagely upon his assailants, and died—after killing and wounding

dogs and men—transfixed by spears and javelins. Our Saxon forefathers, in the middle ages, deemed the wild boar one of the noble "beastes of venery," and kept a powerful breed of hounds for the chase. The weapons used by the huntsmen were spears, and a sort of short sword, or *couteau de chasse*. The spears were used when the boar was brought to bay, and the attack gave abundant opportunities to the hunters of showing their skill and courage. The loud blast of the horn, mingled with the shouts of men and the baying of the hounds, proclaimed the vigorous home-thrust which brought the savage lifeless to the ground. The hunters were always mounted on horseback; and, instead of meeting the animal with spears, attacked him with javelins, which were launched at him as he fled, or as he rushed to the charge, which was often so determined that the horses could not be brought to stand the shock, or, if they did, were thrown down and gored. Serious accidents sometimes occurred. Mr. Johnson relates an Indian instance, in which a large and resolute boar, after being driven by the hunters into a plain, stood at bay, and challenged the whole party. He charged every horse that advanced within fifty yards of him, with great ferocity, causing them to rear and plunge, and throw off their riders, whose lives were in jeopardy. Though many of the horses were accustomed to the sport, none would stand his charges, or bring the rider within javelin distance; and at last, he fairly drove the party from the field; and then, gnashing his tusks and foaming, made his way to the jungle, where it was useless to attempt to follow him.

The wild hog was once common in Britain; and it is surprising, considering the passion for the chase, which seems to be part and parcel of our English temperament, that this animal is not re-established in some of its old haunts, the parks and forests of nobility. Englishmen in India are enthusiastically fond of chasing the wild boar; but, as there is greater room in that country than in this, for such a ferocious monster to play his gambols, it may be as well to leave him there. Perhaps the revival of boar-hunting in England would not be attended with that success which some enthusiasts may anticipate. When that animal tenanted our glens and forests, however, he was by no means held in slight estimation. He enjoyed royal protection; and there are in existence various records, which principally consist of edicts or proclamations issued, announcing sundry pains and penalties as the consequence of its illegal destruction. Howel Dha, or Howel the Good, gave permission to his grand huntsman to hunt the boar from the middle of November to the beginning of December; and William the Conqueror inflicted, as a punishment, the loss of sight on those who illegally killed the boar. In the old forest laws, the season laid down when the animal might be hunted, was from Christmas to Candlemas.

In the *History of the Anglo-Saxons*, by Sharon Turner, we are informed, that "among the drawings in the Saxon Calendar, in the Cottonian Library (Table vi. 4), the month of September represents a boar-hunt. A wood appears, containing boars. A man is on foot with a spear; another appears with a horn slung, and applied to his mouth; he also has a spear, and dogs are following." And in the *Saxon Decalogue*, we have this conversation:—"I am a hunter to one of our kings!" "How do you exercise your art?" "I spread my nets, and set them in a fit place, and instruct my hounds to pursue the wild deer till they come to the nets and are entangled, and I slay them in the nets." "Cannot you hunt without nets?" "Yes; with swift hounds I follow the wild deer." "What wild deer do you chiefly take?" "Harts, boars, and fallow deer." "Did you hunt to-day?" "No, because it was Sunday; but yesterday I did. I took two harts and a wild boar." "How?" "The harts in the nets, and the boar I slew." "How dared you slay him?" "The hounds drew him to me, and I, standing opposite to him, slew him. Such was his fate—one of the most handsome animals I ever beheld of his kind, and such as few have ever seen the like. His size was very great; whilst his enormous tusks added a formidable fierceness to his appearance, which I shall never forget."

Strutt thus mentions the wild boar in the days of Edward the Second:—

"Master John Gyfford and William Twety, that were with King Edward the Second, composed a book on the craft of hunting, the which book is now preserved in the Cottonian Library.

Part of it is in verse: it runs thus, with no inapt admonition against a life of idleness:—

"'All such dysport as voydeth ydlenesse
It syttyth every gentleman to knowe,
For myrth annexed is to gentlenesse.
* * * * *
And for to sette yonge hunterys in the way
Of Venery, I cast me fyrste to goe
Of which foure beastes be—that is to say,
The Hare, the Herte, the Wulf, the *Boor* also.
And thare ben other bestis five of chase
The Buck the first, the seconde the Do,
The Fox the thyrde, which oft has harde grace,
The forthe the Martyn, and the last the Roe.'

"The *boor*," say the authors of the book referred to, "is first a *pig* as long as he is with his damme; and when the damme levyeth him, then he is a *gorgeant;* and in the thirde yeare he is called an *hoggast*; and when they be foure yeares of age, they shall depart from the *sounde* for aye; and when he *goeth soole*, then he is called a *boor*."

At what precise period the wild boar became extinct in our island cannot be exactly determined; it is evident, however, that as population increased, and the vast woods which spread over many parts of the country were cut down and the land cleared, that the range of the boar would become more and more limited, and its numbers decrease, till at length its extirpation would be complete. We look in vain for the forest which, in the twelfth century, covered the country to the north of London; and of which Fitzstephen, in the reign of Henry II., writes, observing that, "on the north are corn-fields and delightful meadows, intermixed with pleasant streams, on which stands many a mill, whose clack is so grateful to the ear; beyond them an immense forest extends itself, beautified with woods and groves, and full of the lairs and coverts of beast and game, stags, bucks, boars, and wild bulls." Banished, however, as the wild boar is from among our native mammalia, "its name is immortalised," as Mr. Bell observes, "by having given origin to the appellation of many places in different parts of the country, and by its introduction into the armorial bearings of many distinguished families of every division of the kingdom."

The special haunts of the wild boar in ancient times, are distinguished by such still-existing names as "Wild Boar's Fell," in Cumberland; "Barlow," or "Boar's Field;" Byre Hills, formerly "Boar's Hills," near St. Andrew's, in Scotland; Mucros, near Killarney, in the county of Kerry, in Ireland; and Mucross, in Fifeshire, Scotland—meaning literally, "Boar's Promontory." This last designation originated in commemoration of the slaughter of an enormous boar, which had previously committed terrible ravages throughout the surrounding country. "The village of Brancepeth," says Mr. Bell, in his *History of British Quadrupeds*, "and the adjoining hill of Brandon, in the county of Durham, took their names from a wild boar or *brawn*, which is recorded to have been a terrific beast, and the dread of the whole neighbourhood; his den being on Brandon (brawn's den) hill, and his usual path or tract leading through the woods of Brancepeth (brawn's path). Tradition states, that one Roger Hodge, or Hoodge, valiantly slew the monster, and delivered the district from his ravages. The seal of this illustrious Roger still remains, and represents a boar *passant*."

Fitzstephen, who wrote in the latter part of the twelfth century, states that boars, wolves, wild bulls, and other game, abounded in the great forests surrounding London; and Scottish writers have not failed to mention those of

"Caledonia, stern and wild."

And it is known, that so recently as the date of Charles I., that monarch endeavoured to introduce the wild boar to the New Forest, Hampshire. They were, however, all destroyed during the time of the civil wars.

Formerly the boar's head was held as a trophy of victory won in single combat between the hunter and the enraged beast. Woe to the former, if, either from want of skill or weakness of nerve, he missed his aim. The attack of the roused animal, like that of the Spanish bull in the arena, was both sudden and impetuous, ripping up with his formidable tusks whatever came in his way, whether man or horse! Shakspeare's description of an enraged boar is as true as it is graphic.

"On his bow-back he hath a battle set,
Of bristly pikes that ever threat his foes;
His eyes like glowworms shine when he doth fret;
His snout digs sepulchres where'er he goes.
Being moved, he strikes whate'er is in his way,
And whom he strikes his cruel tushes slay."

The genus *Sus*, as at present constituted, contains, besides the common wild hog and its domestic relatives, two other species known to naturalists. Of these, one is the Papuan hog, or Bêne of the natives of New Guinea (*Sus Papuensis*), figured and described in the *Zoologie de la Coquille*, by MM. Lesson and Garnot. It is remarkable for its small size, its light and agreeable proportions, and the shortness of the tusks. It is common in the forests of New Guinea, where it is esteemed by the native Papuans as delicate food, and who contrive to catch these animals when young, and rear them in a state of domestication. The other animal is the Wood-swine of Southern and Eastern Africa, and of Madagascar—the Bosch-Vark of the Dutch colonists of the Cape (*Sus larvatus*, Cuv.). This savage and formidable brute resembles the wild boar of Europe; but its head is larger in proportion, its snout broader, and an elevated callous protuberance is seated on the cheeks between the tusks and eyes, imparting a revolting aspect to the physiognomy. Prompt and vicious, the Bosch-Vark is much to be dreaded in combat, its strength and the size of its tusks rendering it a match for almost any foe. It dwells in excavations in the ground, where it is dangerous to attack it, as it suddenly rushes out from its retreat, and deals rapid destruction among its assailants. Dr. Smith observes that this species is subject to great variety of colouring, scarcely any two specimens being precisely alike. Some are of a brownish black, variegated with white; and others are of an almost uniform light reddish brown, or rufous without white markings; and it is scarcely possible to say which is the most prevailing style of colouring. The bristles are long, particularly upon the upper parts of the neck and back; the canines are of huge size and strength; the ears are short, and thinly covered, both without and within, with coarse black hair, which is longest at their tips. The tail is thinly covered with black bristles. Average length of body, between four and five feet; of the tail, one foot.

The discovery of the bones of an extinct hog, of huge size, in the cavern of Sundwick in Westphalia, is due to M. Goldfuss. Bones of three distinct species occur in the Epplesheim sand (Miocene division of tertiary deposits, Lyell); and fossil relics of a species have been found in Hutton Cave, in Mendip, and in other places. Several species of an extinct genus (Chæropotamus), closely allied to the hog, have been discovered in the gypsum of Montmartre, in certain strata in Switzerland, and in the Eocene formation of the Isle of Wight.

CHAPTER II.

THE DOMESTIC HOG, AND FOREIGN VARIETIES.

The domestic hog is too well known to require particular description, and its utility too well appreciated to call for comment. It is not, however, valued alike in all countries; and in some it is regarded with abhorrence. In India, both Brahmin and Mussulman reject its flesh as food; yet, in many districts of that country, semi-domesticated hogs wander about the villages, feeding on the refuse which they pick up in the streets. Colonel Sykes states, that in Dukhun, "every village abounds with hogs; but any property in them is equally abjured by individuals and the community." Detestation of the hog was a feeling entertained by certain nations in remote antiquity. The animal was classed by the Jews among the vilest of quadrupeds; and in Egypt the swineherd was numbered among the profane, and forbidden to enter the temples of their gods. Even the lowest dregs of the people refused to bestow their daughter on him in marriage. The Egyptians sacrificed the hog

to Bacchus, and also to the moon when full. "In the evening of the festival of Bacchus," says Herodotus, "though every one be obliged to kill a hog before the door of his house, yet he immediately restores the carcass to the swineherd that sold him." The ancient Scythians, according to the same authority, made no use of swine, nor suffered any to be kept in the country. The Abyssinians and the Copts of Egypt, as well as the Mohammedans, reject the flesh of the hog. Among the ancient Greeks and Romans, though the office of swineherd appears to have been held in contempt, the flesh of the hog was in high estimation, and a sucking pig was as favourite a dish with them as it is with many of our own countrymen at the present day. The Chinese have derived no prejudices against the hog from the Mohammedan nations of the East: on the contrary, they rear these animals in great numbers for the sake of their flesh; and even the numerous population, who tenant the floating town of rafts or barges, contrive to keep and rear them. "One of the most singular circumstances," says Mr. Wilson, in the *Quarterly Journal of Agriculture*, "in the domestic history of this animal, is the immense extent of its distribution, more especially in far-removed and insulated spots inhabited by semi-barbarians, where the wild species is entirely unknown. For example, the South Sea Islanders, on their discovery by Europeans, were found to be well stocked with a small black-legged hog; and the traditionary belief of the people, in regard to the original introduction of these animals, showed that they were supposed to be as anciently descended as themselves. Yet the latter had no knowledge of the wild boar, or any other animal of the hog kind, from which the domestic breed might be supposed to be derived."

The domestic hog is by no means destitute of intelligence, and little deserves the character of a stupid filthy brute, as some are pleased to give it. As regards filthiness, this, in a great measure, depends on its keeper. It is true that, like the elephant and hippopotamus, it delights to wallow in the mire; but no animal more luxuriates in clean straw; and when it is styed up in filth, justice is not done to it. The hog is a "huge feeder;" but so are the horse and ox; and a fat hog is a more comely-looking beast than one that is lean and ill-fed. With respect to intelligence, it may be ranked far before the ox and horse, though it is less docile. In Minorca it is used to draw the plough, and works well; and Pennant says, that in the district of Murray, between the Spey and Elgin, in Scotland, it was formerly employed for the same purpose; and that a credible eye-witness informed him, "that he had seen, in his parish there, a cow, a sow, and two young horses, yoked together, and drawing a plough in light sandy soil, and that the sow was the best drawer of the four." The senses of taste, smell, and hearing are possessed in great perfection by the hog. It is a saying among a certain class of persons, that pigs can smell the wind; and they are certainly aware of the approach of a storm, as they have often been seen in a state of great agitation during its continuance, screaming, and running about with straw in their mouths, or carrying it to their sty as if to add to their shelter. In Italy, advantage is said to be taken of the sense of smell with which this animal is endowed in searching for truffles; and in our own country, the famous sow Slut, of which we have spoken in a preceding division of this work, was broke-in to the gun, and stood to her game as staunch as the best pointer. But it is now time to speak of some of the continental varieties of this animal, before noticing the British breeds.

Perhaps the most important is—

THE WESTPHALIAN BREED.

The hams of this species have, in this country, become greatly celebrated, from the peculiar excellence of their flavour; and, on this account, large numbers of them are imported from Germany. The animal which supplies these is closely allied to the wild boar of his native country, and, like him, roams the forest in search of food, which principally consists of acorns and beech-malt, to which they are extremely partial, and which gives a favourable development to their flesh. After they have fattened themselves upon this, they are driven home to be slaughtered. In former ages, in Britain, the acorn was the principal food of the hog, as its flesh then formed a large proportion of the diet of the people, who esteemed the increase or multiplication of these animals

as a necessity to their comfort and happiness, if not absolutely to their existence. Even at the present day, the hogs of Spanish Estremadura are mostly reared on the acorns of the Ballota oak. In the Westphalian species, the colour of the adult varies. Many are so coloured, that, were it not for their superior condition and less bristly appearance, it would not be an easy matter to point out any striking difference between them and their feral relatives; but in every case, whatever may be the hue of the parents, the young are, at birth, and for some months afterwards, marked with the longitudinal bands so characteristic of their wild blood. In several parts of England, especially in the New Forest, herds of swine are permitted to roam at large during the acorn season, and, when driven home, are said to be in prime condition. From this circumstance it may readily be inferred how valuable were the oak forests of our forefathers to their very subsistence, by enabling them to feed and fatten their swine. Indeed, one of the most oppressive measures of William the Conqueror, was that by which he converted the English forests into hunting-grounds, and thereby deprived the people of the means of rearing their hogs to a good condition. It was felt to be such a grievance, that King John was called upon to remit it at Runnymede, when, on June 19th, 1215, he was, by his assembled subjects, forced to sign *Magna Charta*. Swine, like some other animals, seem naturally disposed to return to their feral condition, should an opportunity offer, and the circumstances be favourable to their feeding. Mowbray tells us, that two young boars, retiring into a wood between Colchester and Mersey Island, continued, for years, to be the terror of the neighbourhood. The Westphalian swine are seldom over-fat; but they are not on that account to be deemed difficult to fatten. On the contrary, they take on fat with great readiness, and attain to an enormous weight.

THE NEAPOLITAN BREED.

The colour of the Neapolitan breed is black, with little hair on their bodies, and no bristles whatever. Their flesh has a very delicate flavour, the fat being entirely destitute of that rankness which characterises that of some other varieties. Most of the native English breeds may be improved by a cross with the Neapolitan. Indeed, by far the larger portion of the middle breed of pigs, in all the counties of England, manifest some relationship to it by the existence of blue spots on different parts of the body. Mr. Rowlandson, the author of the Prize Essay of the Royal Agricultural Society of England, on the *Management of Pigs*, endeavours to prove that the Neapolitan is the original breed of pigs; and even urges that the Essex, or rather the improved Essex breed, is due to that race, of which he says it is an improvement; but Mr. Milburn thinks that the Italian climate, operating on the wild boar domesticated, as well as that of China, softened down the asperity of activity and bristles, and made the soft delicate animal we now see, in the shape of the one or the other of these varieties. "With the true Berkshire breed," he continues, "the Neapolitan produces a cross, to be surpassed by none in every desirable quality that the breeder could look for, more especially if a dash of the *white* Chinese be added. The intermixture of these three breeds—the Neapolitan, Chinese, and Berkshire—may be regarded, if done judiciously, as the *ne plus ultra* of swine-breeding Thus was produced that long-celebrated breed kept by Lord Harborough. After having been a short time in this country, the Neapolitan hog begins to lose his naked appearance, and to acquire a coat better suited to the more chilly climate into which he has been introduced."

THE FRENCH BREEDS.

It is believed that the French breeds have some relationship to the Chinese variety of the hog, as the breeders of that nation have been long acquainted with the valuable qualities of the variety which claims the celestial empire for its original habitat. The most distinguished of these breeds are those of Poitou, the Pays d'Auge, Perigord, Champagne, and Bologna. In describing these, it may be observed that the Poitou breed has a long and somewhat large head, with pendulous and rather coarse ears—an elongated body, broad and strong feet, and large bones, with coarse bristles and hair. That of the Pays d'Auge has a sharp muzzle, and a smaller head, narrow and pointed ears, long body,

broad and strong limbs, but small bone. Its hair is also coarse, but scanty in quantity, and of a white colour. The Perigord are generally black, with a very short thick neck, and a broad compact carcass. The swine of Champagne are of considerable size, long-bodied, and flat-sided, with broad pendulous ears, and not favourably looked upon. Those of Bologna are related to the English breeds. They are of a large size, have a large and broad ear, are quick fatteners, and white in colour. It is to these that we are indebted for the celebrated Bologna sausages.

The following extract from the *Annales d'Agriculture Française*, presents us with the unsuccessful trials of a breeder to improve his stock:—"I commenced," he says, "with the *large* Shropshire pigs. They pleased my eye, and, for some little time, I felt perfectly satisfied. In a short time, however, I began to observe that, although they devoured an immense quantity of food, they fattened but very slowly, and seemed to derive no advantage from the herbage and vegetables which they *found in the fields*. When killed, the flesh, and especially the fat, was exceedingly coarse. The sows, nevertheless, produced many pigs at each farrow, which, from their size when young, sold well to persons who were tolerably rich, and knew little or nothing about the breeding of pigs. I next tried the small Berkshire pigs, and immediately perceived a very sensible improvement. They fattened quickly, procured most of their nourishment *from the fields*, and their flesh was very superior to that of the last-named breed. But as they were large, I thought to effect a still greater improvement by exchanging them for the Chinese; but here I fell into the opposite extreme. The Chinese were prolific, fattened speedily, and almost *obtained their own subsistence;* but they were faulty in form, and their flesh was not firm, but loose in fibre, as if they had died of disease." Jutland swine are long-bodied, curve-backed, long-legged, with large pendulous ears; and they attain a very great size. They, however, are of a coarse make, and heavy-boned. Sweden possesses many different breeds, the favourite being a supposed off-shoot from the wild boar, with erect ears, a turned-up snout, and long, bony legs. The hogs of Russia and Poland are small, but they are hard feeders. Their colour is that of a reddish yellow, and their hair is very rough. The Hungarian pigs are of a grey colour, with straight, pointed ears, short body, and short and firm legs. These are very rough in the coat, and the young are marked with longitudinal bands—two circumstances indicative of a connection, and that by no means remote, with the wild boar. They inhabit Turkey in Europe, Bosnia, Croatia, Hungary, and Austria, and are designated according to the country from which the specimen immediately in question may have been procured. In reference to the Portuguese hog, it is so extremely like the Chinese, that it has, by Mr. Laurence, been made a question whether these varieties are not identical; the former being but the latter naturalised in that of Portugal.

THE CHINESE BREED.

The Chinese hog is found in the south-eastern countries of Asia, as Siam, Cochin-China, the territories of the Birman empire, the kingdom of Cambodia, Malacca, Sumatra, and in Batavia, and other islands of the Eastern Archipelago. There are also *varieties* in India and China.

The principal point of difference between the hog of Siam and that of China Proper, is, that the former is usually black, whilst the latter is of a white colour. Neither, however, exhibit a constant uniformity in this respect, the colours of each frequently varying—the blacks coming from China, and the whites from Siam. Even in the same litter, pigs of different colours frequently appear; and instances are not uncommon in which even *pied* individuals have occurred. On account of these differences of colour, some have gone so far as to assert that there are no fewer than seven varieties of the Chinese pig; but, as the distinctions are referred only to colour, these varieties can hardly be said to have more than a hypothetical existence. The small white breed is almost perfect in make and quality. Parkinson says—"These are certainly pigs in miniature; their legs about two or two-and-a-half inches long; their ears, the size of a large leaf on an apple-tree; the length of the jaw, from the snout end to the crown, about six inches; from the crown to where the tail is set on, about two feet; with height proportionate;

weight, when full-grown and fat, six stones, at two years old." The black variety is of similar shape and beauty, and, when fat, is of a heavier weight. Both the Chinese and Siamese pigs feed well, and attain to an early maturity. They require less food, and, within a given time, become fatter and heavier than any of the European varieties. To the flesh of the pig the Chinese are remarkably partial, and they fatten it to an enormous extent, taking great care that the animals which yield it are thoroughly attended to, and fed regularly. Those which are kept in temples become perfect monsters, and are viewed by the Chinese with an eye of great tenderness and partiality. They are not even permitted to distress themselves with walking, but are often carried from one place to another, to which may be attributed the admirable qualities of their pork. The animals are kept especially dry and clean, which, no doubt, has a corresponding effect upon their health; and the very knowledge of which has a tendency to impart a greater relish to their flesh when it is brought to the table. Those which are generally seen in this country, principally come from the neighbourhood of Canton, and have been brought thence as part of sea-stock. They have greatly improved the larger kinds of our English pigs, having been advantageously crossed with our own coarser domestic breeds. The offspring of this cross have shown a vast improvement even in their Chinese progenitor; and, on the whole, proved a most profitable breed.

The Chinese pigs are less known in Ireland than in England or Scotland; although the climate of the last-named country would appear unsuitable to their Asiatic temperament and constitution, probably from the variableness of its temperature.

CHAPTER III.

BRITISH BREEDS OF THE DOMESTIC HOG.

We have, in a previous chapter, alluded to the fact of the hog being of great importance to our Saxon ancestors. Its flesh was a staple article of consumption in every household; and a great portion of the wealth of the farmers and landed proprietors consisted of droves of swine, which were attended by swineherds, thralls, or bond-slaves, and which were driven into the woods of oak and beech, in order to feed on acorns and mast, and all the while guarded from the attacks of the wolf. The domestic hog of that period, appears to have closely resembled, in form and colour, the wild species; and the old unimproved breed, now seldom seen, may be regarded as its modern representative. There are now, in our island, several breeds of this useful animal, of acknowledged excellence, the result of judicious crossings. The test of excellence is productibility, a readiness to become fat, small bone, and the quality of the whole animal when converted into bacon. Size is of minor importance. The introduction of the small Chinese breed is one great source of improvement. This breed, we have said, is short in the head, with neat ears, low on the limbs, and high in the chine. It is very prolific, and fattens readily. The prevailing colours are black, or half black and half white. Another, closely allied to it, extends from China throughout various groups of islands in the Pacific. The breed nearest to the Chinese, in this country, is the Suffolk, which is generally white, compactly made, and deep in the chest.

Another source of improvement is the Neapolitan hog. This, as already described, is a plump animal of a black colour, without any hair, and with a singular predisposition to become fat. It is, however, of a tender constitution. The pure black breed of Essex, which has very little hair, is closely allied to it; and when crossed with the Neapolitan,

produces a most valuable stock. A cross between the Neapolitan and Berkshire breed is also in high esteem. A breed between the Berkshire, Chinese, and Neapolitan, may, by careful selection, produce every quality which can be desired—great fecundity, an early acquisition of fat, and moderate size, with admirable form and proportions. Mr. Cully asserts, that there are, in this country, only three true varieties of the domesticated hog—the Berkshire, the Chinese, and the Highland, or Irish; and that all other breeds, although they have a separate description, are nothing more than off-shoots from one or other of these three main stocks. In some degree this may be true; but these themselves, must, at the same time, be regarded as only off-shoots from the great original wild stock. To distinguish these, therefore, as the primitive breeds to which we are indebted for all the other breeds now *grown* in Britain, is to give them a distinction which can hardly be said to belong to them. Indeed, the fact of the matter is, that we are not only indebted to these breeds for the numerous varieties amongst us, but to the Spanish, Portuguese, Italian, and African hogs, as well as to the wild boar of the large forests of Europe.

THE BERKSHIRE HOG.

Berkshire was the first county to avail itself of the opportunity of improvement afforded by the introduction of foreign stock; and among the black breeds, the improved Berkshire stands at the top of the list, either for breeding pure, or crossing with other breeds of inferior qualities. The old breed is said to be now extinct; but, for a long period, it had a high reputation, and held a prominent place among breeders or rearers of swine. The improved Berkshires are almost all traced back to the herd of Lord Barrington, who died in 1829. In Mr. Youatt's treatise on the pig, we find it remarked, that the improved race is now considered, by the Berkshire farmers, to have deviated into a middle-sized and a small-sized breed. To rank in the first class, they should be well covered with long, black, silky hair; whilst the white should have only four white feet, a white spot between the eyes, and a few white hairs behind each shoulder.

The old race of Berkshires had a long and crooked snout, with the muzzle taking an upward turn; the ears were large and heavy, with a slight inclination to be pendulous; the body was not deep, but long and thick; whilst the legs were short, the bone large, and the size enormous. The modern improved Berkshire is an animal of large size, which, to be fully developed, should not be allowed to breed until it is over a year old. Mr. Sadler, one of the most successful improvers of Berkshires, considers the improved breed superior to any other black breed for size, quality, hardness of constitution, fruitfulness, early maturity, and aptitude to fatten. The Rev. T. C. James, one of the judges of pigs at the Royal Agricultural Society's show at Warwick, in 1859, says, that "the improved Berkshire is a good big animal, well calculated to produce a profitable flitch. A good little pig is very well, but a good big pig is better, if with aptitude to fatten. Two exhibited at Chelmsford, in 1856 (of Sadler's breed), weighed each twelve score at seven months old; and, with that weight, were of such good constitution, that they were well upon their legs. They had walking exercise in an orchard every day while fattening." The Mr. Sadler alluded to in this passage, resides at Bentham, near Crickdale, and is one of the most successful improvers of Berkshires: his original stock all came from the herd of Lord Barrington. Speaking of the Berkshire breed, Mr. Loudon says, "that they are, in general, of a tawny, white, or reddish colour, spotted with black; large ears hanging over the eyes; thick, close, and well-made in the body; short legs; small in the bone, with a disposition quickly to fatten, and, when well fed, producing fine flesh. This county has long been famous for its breed of swine, which are excellent in all respects, but particularly so as a cross for heavy, slow-feeding sorts. It has extended itself from the district from which it takes its name, over most parts of the island; is the sort mostly fattened at the distilleries; feeds to a great weight; is good either for pork or bacon; and is supposed by many to be the most hardy, both in respect to its nature and the food on which it is fed." Mr. Bakewell, the founder of the new Leicester sheep, was a great improver of domestic swine.

"Before his time," says Mr. Martin, "the

Leicestershire hogs were of the same coarse, ungainly kind, which prevailed generally throughout the midland counties. He commenced, as he had done with the sheep, by a judicious selection of stock destined for breeding; and, by persevering in this course, he greatly modified the characters of the old races. This was imitated in Yorkshire. The old breed, by crossings with the new Leicester stock, was much improved. The cross breed lost in size, but gained in every other good quality. It became deep-chested, short-limbed, small-boned, and fattened readily. The coarse ugly bristles were exchanged for fine thin hair, and the whole aspect of the animal underwent a transformation. The hogs, at about two years old, averaged from thirty to fifty, and even sixty stones, of 14 lbs.; the younger animals weighing in proportion."

Some of the Yorkshire breeders still rear the pure new Leicesters, and consider them more profitable than the larger kinds. These breeds have also found friends in Yorkshire; and among these, are the Berkshire crosses with the old Yorkshire, and with Lord Western's improved Essex breed. The improved Berkshires are classed among large swine; but the effect of crossing with various smaller breeds, has been to reduce the size and improve the shape; so that the present Berkshires are short of limb, roundly made, arched in the neck, with heavy cheeks, sharp ears, and abruptly rising forehead, short snout, broad back, and clean limbs. In colour they are usually a mixture of half white, half black. The average weight of an improved Berkshire hog, fit to kill, is about 400 lbs.; but ham-curers purchasing them from the farmers, give a preference to the smaller breed, which averages from nine to fourteen score.

THE HAMPSHIRE HOG

This hog is about the same size as the Berkshire; but as less attention has been paid to its improvement, it possesses a degree of coarseness to which the other is a stranger. It is generally black, or spotted with red; but there are, also, a considerable number of white pigs in this county. Within the last twenty years a great improvement has been produced in their make, which may be considered to have been forced upon the breeder, on account of his being so near a good market where improved animals could meet with ready disposal. No Hampshire farmer, however, has distinguished himself as a pig-breeder; and we do not remember an instance of Hampshire pigs carrying away any of the prizes at the Smithfield show. From these facts we may draw the conclusion, that although the county is productive of excellent hogs, still these are not such as would be chosen to establish a new, or improve an old breed. The New Forest of Hampshire was long notable for the numbers of swine which fed upon the acorns that fell from its oaks. Even so recently as the time of the Rev. Mr. Gilpin, we find him describing, in his *Remarks on Forest Scenery*, the manner in which the swine were suffered to regale themselves as they wandered beneath the umbrageous trees, which were the means of both sheltering and nourishing them:—"These woods afford excellent feeding for hogs, which are led in the autumn season into many parts of the forest, but especially among the oaks and beeches of Boldre-wood, to fatten on mast. It is one of the rights of the forest borderers to feed their hogs in the forest during the *pawning month*, as it is termed, which commences about the end of September, and lasts six weeks. For this privilege they pay a trifling acknowledgment at the steward's court at Lyndhurst. The word *pawnage* was the old term for the money thus collected. The method of treating hogs at this season of migration, and of reducing a large herd of those unmanageable brutes to perfect obedience and good government, is curious. The first step the swineherd takes is to investigate some close-sheltered part of the forest, where there is a conveniency of water, and plenty of oak or beech mast, the former of which he prefers, when he can have it in abundance. He fixes next on some spreading tree, round the bowl of which he wattles a slight circular fence of the dimensions he wants; and covering it roughly with boughs and sods, he fills it plentifully with straw or fern. Having made this preparation, he collects his colony among the farmers, with whom he commonly agrees for a shilling a-head, and will get together perhaps a herd of five or six hundred hogs. Having driven them to their destined habitation, he gives them a plentiful supper of

acorns or beech-mast, which he had already provided; sounding his horn during the repast. He then turns them into the litter, where, after a long journey and a hearty meal, they sleep comfortably. The next morning he lets them look a little around, and shows them the pool or stream where they may occasionally drink; then leaves them to pick the offal of the last night's meal; and, as evening draws on, gives another plentiful repast, scattering acorns among them for an hour together, to the sound of his horn. He now sends them again to sleep. The following day he is perhaps at the pains of procuring them another meal, with music playing as usual; and then leaves them a little more to themselves, having an eye, however, to their evening hours. But as their stomachs are full, they seldom wander far from home, retiring generally very early to bed. After this he throws the sty open, and leaves them to cater for themselves; and from henceforward has little more trouble with them during the whole time of their migration. Now and then, in calm weather, when acorns fall sparingly, he calls them perhaps together, by the music of his horn, to a gratuitous meal; but in general they need little attention, returning regularly home at night, though they often wander, in the day, two or three miles from their sty. There are experienced leaders in all herds, which have spent the roving life before, and can instruct their juniors in the method of it. By this management the herd is carried home to their respective owners in such condition that a little dry meal will soon fatten them. The hog is commonly supposed to be an obstinate, headstrong, unmanageable brute. He may, perhaps, have a degree of positiveness in his temper; in general, however, if properly managed, he is an orderly, docile animal. The only difficulty is to make your wishes, when they are fair and friendly, intelligible to him. Effect this, and you may lead him with a straw.

"Nor is he without his social feelings, when he is at liberty to indulge them. In these forest migrations, it is commonly observed, that of whatever number the herd consists, they generally separate, in their daily excursions, into such little knots and societies as have formerly had habits of intimacy together; and in these friendly groups they range the forest, returning home at night in different parties, some earlier and some later, as they have been more or less fortunate in the pursuits of the day. It sounds oddly to affirm the life of a hog to be enviable; and yet there is something uncommonly pleasing in the lives of these emigrants—something at least more desirable than is to be found in a hog *Epicuri de grege*. They seem themselves, also, to enjoy their mode of life. The hog has a greater variety of language than, perhaps, any other quadruped. He signifies his want of food with great energy; when affronted, his note is very significant; and his cries of distress are truly lamentable. But here you see him perfectly happy, going about at his ease, and conversing with his friends in short, pithy, interrupted sentences, which are, no doubt, expressive of his enjoyments and of his social feelings. Besides the hogs thus led out in the mast season to fatten, there are others, the property of forest-keepers, which spend the whole year in such societies. After the mast season is over, the indigenous forest-hog depends chiefly for his livelihood on the roots of fern; and he would find this food very nourishing if he could have it in abundance. But he is obliged to procure it by so laborious an operation, that his meals are rarely accompanied with satiety. He continues, however, by great industry, to obtain a tolerable subsistence through the winter, except in frosty weather, when the ground resists his delving snout; he must then perish if he do not, in some degree, experience his master's care. As spring advances, fresh grasses, and salads of different kinds, add a variety to his bill of fare; and, as summer comes on, he finds juicy berries and grateful seeds, on which he lives plentifully, till autumn returns and brings with it the extreme of abundance. Besides these stationary hogs, there are others, which, in some of the more desolate parts of the forest, are bred wild, and left to themselves without any settled habitation; and, as their owners are at no expense, either in feeding or attending them, they are content with the precarious profit of such as they are able to reclaim."

This kind of feeding has brought the Hampshire bacon much into demand; and it brings even a higher price than the Westphalian. This is, in some measure, to be attributed to the manner in which it is cured, and which

has been greatly the means of preserving its high reputation.

THE SUFFOLK HOG.

Mr. Richardson, with some other writers, thinks that the Suffolk hog is the most nearly allied to the Chinese; and Mr. Loudon describes it as a small, delicate, white pig, which, for many years, has enjoyed a great reputation. It is shorter, he says, and more pug-formed than the Norfolks; and, by its dish-face and pendent belly, it may be supposed that the variety proceeded originally from the white Chinese. Some of them are extremely handsome, and very regularly shaped. Others have observed, that the Suffolk is the best bred race in England; but whether such be the case or not, is a matter of opinion. "The present breed of Suffolk," says Mr. Richardson, "or, at least, that which existed in that county within the last few years, is a long, straight-backed pig, with a broad forehead, and short, bristly hair; appearing large and heavy from its extreme length." Prince Albert was very successful with a cross of the Suffolk and Bedford.

The improvement in the Suffolk breed consists in small and light offals, with greater length being obtained. It is a white pig, and, on several occasions, has figured popularly in the Smithfield Club Show; but the most celebrated pigs are quite black. Mr. Crisp, of Butly Abbey, a distinguished Suffolk breeder, reared both black and white pigs. The best Suffolks now, however, are Yorkshire-Cumberlands, which have settled in the county, and have found their way to Windsor.

THE YORKSHIRE HOG.

The old Yorkshire pig was a large, narrow animal, having a strong coat of white hair, and a few pale-blue spots on the skin, the hair on these being white. It was long-headed, great-eared, long-legged, and strong in the bone. A long period elapsed before it attained its full growth, when it could be fattened up to 800 lbs.; but it is doubtful if this could be done with profit. The first step taken for the improvement of this breed, was the introduction of the white Leicesters to Yorkshire. These were a large species; but their heads were smaller than the old sort; their ears erect; their hair finer; their bone smaller, but with a carcass less deep, and not so full in flesh. The white Leicesters were the great improvers of the Yorkshire large breed, which is now principally confined to the northern part of the county. On the introduction of the Leicesters, in the early part of the present century, they were carefully bred from until several admirable qualities were obtained—viz., early maturity, beautiful proportion, and a constant fatness, even from the time of their birth. The difficulty with this breed is, how to keep them poor, as the sows have enough to breed and suckle their offspring. This species is denominated the *small breed;* and the spinners and artisans of the large towns, more particularly those of Bradford and Leeds, discover great skill in breeding them. In a new edition of Mr. Youatt's work, we find it stated, that in the West Riding, the competition in pigs is keener than in any other part of England. There is scarcely a town which has not its pig and poultry show, where prizes are presented for pigs reared by working-men, with rules that entirely exclude shopkeepers and small tradesmen. The breed of these competitors is usually of the large or middle-size; and the prizes contended for are—for the first, £4; second, £3; third, £2; fourth, £1. The Keighley Agricultural Association keep a van for conveying the pigs of the exhibitors to their shows; and the following details from Mr. Youatt's work, edited by Mr. Samuel Sydney, places, in a graphic point of view, the enthusiasm which pervades the minds of some of the small pig-breeding fanciers of Yorkshire. "One evening in August, 1858, a stout labouring woman left her home in Airedale, accompanied by her only sow and her litter of pigs, on a journey (by rail) of sixty-five miles, to the city of York, where the Yorkshire Agricultural Society held its show that year. She bore with her the white rosettes of several previous victories of her treasure, 'Lady Kate;' but on this occasion fortune did not smile on her, and 'Lady Kate' suffered her first defeat. Although, however, she did not win the prize, she carried the public pig-breeding opinion so far with her, that she was able to sell all 'Lady Kate's' suckers at £5 a-head. When, next month, the Keighley and Shipton shows arrived, 'Lady

Kate' retrieved her first and only defeat, and stood at the top of her class. Thirty-eight sovereigns had been counted down on the table for 'Lady Kate.' She afterwards reared a litter of sixteen, and enabled her owner to maintain an aged father and invalid sister in comparative comfort. She was, indeed, the prop of the house; and by the side of many a sty in Airedale, for years after her flesh had been consumed in bacon, were her merit and victories discussed in the long summer evenings consecrated to pig-gossip. 'Lady Kate' was of the middle breed; a cross between a small boar and a sow of the modern improved large breed.

"At Northallerton, in 1859, the finest lot of large sows ever seen in one place were collected together. There were at least a dozen, the live weight of each of which would not be much less than half a ton. The Royal Agricultural prize-winner at Norwich only got second honours. When the two famous sows, 'Lady Havelock' and the 'Duchess,' went for the Chester prize, the partisans of each were confident of success, and the betting was hot and heavy. 'Lady Havelock' was in splendid condition, having been bought at a long price, and 'bottled up' specially for this event; while the 'Duchess,' from having weaned her little ones so lately, was not quite up to the mark, but was again in a breeding state, and it was thought that would have weight with the judges. It was, however, universally agreed that one of the two must win, for Yorkshire had never sent anything like them before. On Wednesday night it oozed out that the 'Lady' was the prize-winner. The telegraph was set in motion, and the morning trains brought in a motley crowd of the Leeds pig fancy, with wives, aunts, and sisters, all bound to the Rhoodee, to celebrate the triumph. There the 'missus' of the 'Lady,' excited by the congratulations of her friends, gave her native Yorkshire eloquence full swing, and astonished the assembly with a speech, in which she complimented the judges; vowed that 'Lady Havelock' should lick all the world; whispered her Tom would never have bought the sow but for her, and announced that the prize money should be spent on the spot." In Yorkshire, the prejudice against black pigs is now greatly modified.

THE CHESHIRE HOG.

The size of the Cheshire hog is very great; his proportions having been pronounced gigantic; but is now, however, almost extinct. He was long-legged, long-eared, and had a loose kind of unsightly skin. His colour was either white, patched black and white, or blue and white. The prevailing pigs, now mostly used in Cheshire, are what are termed "Manchester boars," which is only another name for the Yorkshire-Cumberland breed.

THE WILTSHIRE HOG.

This hog is a long-bodied, low animal, hollow about the shoulder, and high on the rump, round in the bone, with middling-sized pointed ears, and of a light colour. It is supposed to have come originally from Wales, and was of comparatively little value; but since it has been crossed with the improved Berkshire breed, its worth has increased. Wiltshire bacon is celebrated, the reason of which may partly be attributed to the judicious crossing which has, from time to time, been practised with the Neapolitan, Chinese, and other improved breeds. These are not so large as the former breed; while they are more compact, and fatten quicker, without any deterioration to the quality of the meat.

THE BEDFORDSHIRE HOG.

Bedfordshire cannot boast of an original pig stock; but one bred at Woburn, and described by Mr. Youatt, was a good animal, although it had no specially-marked character worthy of notice. It was a bad smeller, but a good feeder. It has, however, been allowed to die out; and a race sprung from Berkshire sows crossed with Suffolk boars, has taken its place. At present a white breed is looked upon with the most favour in Bedfordshire. The late Duke of Bedford introduced the improved breed, and was the means of introducing them also to East Lothian in Scotland, where they carried off all the agricultural prizes. They have the peculiarity of growing very rapidly, and, at the same time, when mature, feeding very fast in proportion to the food given. The former breed was so little distinguished, that the tenant of a large farmer in the shire, said he was not aware that such a race had an

existence, until he saw it notified over one of the pens of the late Prince Albert, about ten years ago, at the Smithfield Show.

THE LEICESTERSHIRE HOG.

The original hog of Leicestershire was a large, deep, flat-seated, light-spotted animal, possessed of rather a handsome head, with well-formed ears. Mr. Bakewell, however, by skilful crossing, not only improved the breeds of sheep and cattle, but also those of pigs. Accordingly, his Dishley pigs evinced consummate skill, as did his Leicester sheep. "With symmetrical form," says Mr. Richardson, "as far as rotundity, depth, and thickness could constitute it, he combined such great aptitude to fatten, that it has, with the Chinese and Neapolitan, been the source of almost all the improvements of our breeds of pigs; and a pig is just good 'blood' or bad in proportion as it is allied nearly or remotely to the Dishley breed. There was a little tenderness of constitution, but so much flesh and fat in proportion to time and offal, that it looked more like one great cylinder of flesh than a living animal—the feet, neck, and face being lost in the exuberance of fat. Owing to its lethargic disposition, and thoracic temperament, it is not a vigorous breeder, and much less prolific than many other kinds; neither will it grow so rapidly as some varieties, being more calculated to lay on fat than to make bone and muscle. Still it is a physiological wonder—a triumph of skill." The Leicesters have been crossed into middle, or small Yorkshires, and have been the grand improvers of the large York breed. Mr. J. V. Williams, of Haygrove, Bridgewater, Somerset, in 1854, exhibited a pair of white Leicesters, and received the gold medal of the Smithfield Club. Writing to Mr. Sydney, he says—"I first exhibited in 1852, and have since won, besides the Smithfield Club gold medal, two gold medals of the Paris Universal Exhibition in 1855, five silver medals and cross, and upwards of one hundred prizes." His fat pigs usually average the following weights:—

5	to	6	months	old,	from	7	to	9	score	lbs.
8	„		„	„	„	10	„	12	„	„
10	„		„	„	„	12	„	15	„	„
12	„	18	„	„	„	15	„	18	„	„

The three pigs exhibited in 1854, at eighteen weeks' old, weighed, sinking the offal, nine score each.

THE HEREFORDSHIRE HOG.

Of this animal there is little to say; but it is commonly believed to be the result of a cross with the Shropshire. Mr. Richardson says it is little inferior to the Berkshire breed; and that it is to the adoption of crosses from the boars of Herefordshire and Berkshire, that we are to attribute the major part of the improvement which has, of late years, appeared among the Irish breeds. To the present white breed of this county no attention has been paid, although the sow is acknowledged to be a useful animal.

THE NORFOLK HOG.

The Norfolk breed is small, with pricked, erect ears; and variously coloured, but generally white. They are well-formed, fatten quickly, and produce good meat. Those that are white are said to be the best; but in the vicinity of Lynn, and generally on the Lincoln side of the county, there is a larger spotted variety, of good form and quality. We believe, however, that little or no attention has been paid to this variety.

THE GLOUCESTERSHIRE HOG.

The hog of Gloucester is less in size than the Hampshire breed; still it is of sufficient proportions to be ranked among the larger breeds. It is round in form, somewhat short for its depth in the belly, and altogether presenting a very compact appearance. It is generally white, and has—what may be either an ornament or a disfiguration—wattles hanging from each jaw. Its constitution is hardy; the sows are prolific, and the pigs are very profitable, more particularly for pork. As store pigs they are excellent.

THE NORTHAMPTONSHIRE HOG.

This animal is considered handsome, being very compactly formed, steep-sided, and having little bone. It feeds well, attains early to maturity, and fattens rapidly. For storing or pork it is excellent. It is of a light colour.

THE LINCOLNSHIRE HOG.

The old Lincolnshire breed was a light-

coloured, long-legged, ungainly-looking animal, with a narrow back and a thick skin, covered with close, coarse hair. The head was large, and the forehead being ample, the ears were necessarily placed far apart. It was an enormous eater, and a very indifferent fattener. The true Lincolnshire is now a very different animal from this, having a straight body, round carcass, fine skin, and few bristles. It is generally white, and is easily fattened. At a year and a-half old it will often weigh twenty-five and even thirty stones, giving 14 lbs. to the stone.

THE SHROPSHIRE HOG.

The original breed of this county has been improved by a cross with the Berkshire, Chinese, and other favourite breeds. The former breed was not very well adapted for farm stock; but by brewers and distillers, who have large quantities of refuse grains and mash, they were held in some degree of estimation.

THE CUMBERLAND HOG.

Little has been done towards the improvement of the large Cumberland breed; but the small breed of this county has risen into considerable favour. It is larger than the small Yorkshire, and is the offspring of a cross between the Cumberland and the Yorkshire; the former giving quality and proportion, and the latter affording size. The bacon of this county has attained great celebrity in the north of England. The breed is described as being short in the legs, with a straight and broad back, well-developed ribs, full neck and breast, and good hams. The snout is short; the ears clean, fine, and of moderate size; whilst the body is evenly covered with short, fine hair.

THE SUSSEX HOG.

The hogs of this county are of moderate size, well-formed, thin-skinned, and black and white. The hair upon them is both long and fine. They rarely feed over twenty stones; but they attain an early maturity, fatten quickly, and produce excellent flesh. In this county there was formerly a breed called the Rudgmik swine, among which were some of the largest hogs ever seen in England. Although they yielded capital meat, they were considered very unprofitable, from the time which they took to fatten. They are now extinct.

THE ORIGINAL OLD ENGLISH HOG.

The primitive breeds of England have now almost lost all traces of their individuality, from the different systems of crossing to which they have been subjected, by the spirit of improvement which has possessed many of the breeders of agricultural stock. It may be a question, however, whether this has not been already carried too far. Mr. Low observes—"While we should improve the larger breeds that are left us, by every means in our power, we ought to take care that we do not sacrifice them altogether. We should remember that an ample supply of pork is of immense importance to the support of the inhabitants of this country. England may, one day, have cause to regret that this over-refinement has been practised, and future improvers vainly exert themselves to recover those fine old races which the present breeders seem aiming to efface." The original English breed had a heavy head, a large ear, long legs, and ragged coat, and had by far too much bone to be a profitable animal.

THE ESSEX HOG.

Essex, like other counties, has improved its breed of pigs, by crossing with the Berkshire and Neapolitan races. The original animal, however, possessed some good points; but an improvement seemed necessary, a new breed appeared, and now takes a high place among the different species of Great Britain. The present race has erect ears, a long, sharp head, a short flat back, with small bone. The colour almost invariably is white. It is a rapid feeder, and makes fat so quickly, that before it has obtained its due proportions it usually attains an inconvenient state of obesity. So great, indeed, are its fattening properties, that it sometimes becomes the victim of them.

"One of the finest specimens of the improved Essex breed," says Mr. Richardson, "was reared by C. L. Clare, Esq., of Hindley House, near Liverpool. She won eight first prizes, two seconds, and one third; and several of her litters have been sold for £120. The peculiarities of Mr. Clare's improved breed, are small bone, great aptitude to fatten, early

arrival at maturity, and a small proportion of loss between live weight and dead. A very favourable specimen of the whole, weighed, alive, 688 lbs.; and dead, as much as 653 lbs. —a most unprecedented fact—her offal being but 30 lbs. She was shown at the Yorkshire Agricultural Society's meeting at York, with twenty-nine competitors; and though she did not receive a prize, was highly commended. This, against all the best pig-breeders in the kingdom, showed her to be of a very prime sort."

There is another improved breed in this county, called Half-blacks, supposed descendants of the Berkshire race. Lord Western originally introduced it into the county, and it rose to great celebrity. They are black and white, fine-skinned, short-haired, with smaller heads and ears than the Berkshire, having short snubby noses, and a very fine bone. They are broad and deep in the belly, full in the hind quarters, but light in the offal. They feed remarkably quick, grow fast, and are of an excellent quality of meat. The sows are capital breeders, and bring litters of from eight to twelve; but they have the character of being bad nurses.

THE ORKNEY BREED.

In the Orkney Islands, the Hebrides, and the Shetland Islands, there exists a small breed of swine, characterised by Dr. Hibbert, in his *Account of the Shetland Isles*, as a little, ugly, brindled monster—an epitome of the wild boar, yet scarcely larger than an English terrier. "This lordling of the Shetland scatholds and arable lands," says he, "ranges undisturbed over his free demesnes; and, in quest of the roots of plants, or of earthworms, hollows out deep furrows and trenches in the best pastures; destroys, in his progress, all the nests which he can find, of plovers, curlews, or chalders; bivouacs in some potato field, which he rarely quits until he has excavated a ditch large enough to bury within it a dozen fellow-commoners of his own size and weight. Nor is the reign of this petty tyrant altogether bloodless. When a young lamb is just dropped, it is then that he foams, and, as Blackmore has pompously sung, 'flourishes his ivory war,' never quitting his ground till the grass is stained with the red slaughter of his victim." These small animals give their owners little care, as they are mostly left to shift for themselves in the best way they can. They are wholly unprovided with shelter; and although they must, during some part of the year, undergo great privations, still they are healthy, and produce good and agreeable flesh. In autumn they are in best condition; and if then put up to fatten, very inexpensive provender will suffice for this purpose, as they *lard* themselves with considerable rapidity, growing quickly in size, and presenting a short, diminutive, aldermanic appearance, capable of raising astonishment in the minds of those who, before the commencement of the *bringing up* process, had seen them.

The Rev. George Low, in his *Fauna Creadensis*, describes them as very diminutive creatures, but exhibiting a great variety of colour. They are bristly in the back, stand erect on their legs, and have short, pointed ears. Their snouts are singularly strong, produced, no doubt, by the constant exercise of their grubbing propensities in the inhospitable region to which they are confined. They travel far and near in search of food, wandering over distant hills, and feeding on such roots and earth-worms as they can find. With such roving habits, it need be no matter of wonder that this little animal, notwithstanding his dwarfish size, should perpetrate greater ravages in corn-fields than the most gigantic of our English porcine breeds. This small breed is usually converted into pork, and forms an article of considerable commerce between the natives and the coast, for shipping stores. In Mr. Low's time, the butchers used to purchase the breed from their owners at from four to five shillings a-piece; and after being cleaned and cured, they were disposed of to the shipping contractors at the rate of twopence per pound. The average weight of these pigs is from sixty to seventy pounds. Ropes are made of their hair, and used in the Orkneys by those adventurers who suspend themselves from the summit of the cliffs, in search of the eggs and young of the sea-fowl. They are preferable to those made of hemp, on account of their not being so apt to *cut* from the effects of friction against the sharp edges of the rocks. The Highland pig of Mr. Cully, is the same as that of the Orkney Isles.

THE OLD IRISH HOG.

In Ireland the pig is truly a domesticated animal, often having the snuggest part of the labourer's cabin allotted to him, where he sleeps at his ease, feeds with comfort, grumphs to the children, and fattens for the rent. The old, high-legged, flat-sided race, has for many years been gradually dying out, and is now to be met with perhaps only in Galway, and the western part of the country. An improved breed is taking their place; and as they exhibit all or most of the characteristics of the English races, it has become difficult to discriminate between them. The small cost at which pigs can be kept and fattened, coupled with their extraordinary fecundity, make them a real substantial blessing to many a poor cottier, who, with his small savings, may purchase a young and poor-conditioned animal, fatten it on all the refuse he can spare or collect, and sell it at a very remunerative profit. Nay, he may kill it with advantage to his own family, who will thereby obtain a large supply of a cheap, nutritious, and strengthening diet. Were it not for this animal, numberless individuals of the labouring poor would hardly be able to preserve a roof over their heads; and, on this account, the pig is not inaptly called "the poor man's friend." The improvement effected in Ireland upon her old stock, has been done by the introduction of Berkshire and Chinese boars and sows, with which the old breed has been extensively intermingled. Accordingly, the great size and large bone have been reduced, whilst the fattening qualities have been very much increased. It is well known that England imports a large proportion of the bacon, pork, and live pigs, whether fat or as stores, necessary to her consumption, from Ireland, which has a great tendency to keep up the price of bacon in that country. Notwithstanding the rather unpromising exterior presented by the original old Irish pig, there was one shown, some years ago, at the cattle-show of the Royal Dublin Society, which is said to have been the offspring of a cross with the Hampshire. Whether this was or was not the case, the animal weighed over forty-one stone, and was the property of an humble cottier. It attained that weight with a very small proportion of feeding. Irish swine possess flesh of a peculiarly good flavour, which the principle of improvement does not deteriorate; whilst the hams closely resemble, in form and quality, those of Westphalia.

EXTINCT RACE.

The skull of a variety of pig found in an excavation in an island on Loch Gûr—a lake in the neighbourhood of Limerick—is, by Mr. Richardson, supposed to indicate sufficient evidence of having been the great ancestor of our well-known long-faced pig, once so plentiful in Galway, and usually designated, from its long limbs and gaunt appearance, by the name of the "Greyhound Pig." Several of these skulls were found at Loch Gûr, with those of oxen, goats, sheep, red deer, reindeer, and the extinct gigantic deer, sometimes erroneously styled the "Irish Elk." They were found several feet below the surface, resting on layers of a calcareous tufa, and covered with black bogstuff, the result of the decomposition of vegetable substances. All the skulls, apparently, belonged to animals which had been slaughtered; as their frontals were all broken in, as if by the blow of a pole-axe, or other heavy instrument. It would be difficult to assign the precise period when these animals were thus slaughtered; but, from the circumstance of their being cotemporary with the gigantic deer, it has been suggested as possible that they lived in the times of the Druids, and that Loch Gûr was the scene of one of their vast assemblages, and these osseous fragments the long-buried remnants of a stupendous sacrifice to their sanguinary gods.

Having thus described the principal breeds of swine, several of which present really such very slightly-marked differences from others, that it was almost unnecessary to introduce them to our pages—but, in order to give this work all the fulness possible, we deemed it unavoidable—we may observe, that there are certain fancy breeds, which require no specific description, as being less adapted to the practical, than to the gentleman farmer and breeder. Prominent among these is the Windsor breed, greatly cultivated by his late royal highness Prince Albert; the Coleshill and the Bushy breeds. These are all white, and much sought after by gentlemen pig-breeders, who hold them in high estimation.

POINTS OF A PIG.

In describing the *points* which are to be looked to in making the purchase of what is called a good pig, it may be as well to remark, at the outset, that care must be taken not to be influenced by a mere name. There is nothing easier in the world for an eager and unscrupulous salesman to do, than to say that his pig is a true Suffolk, when it is, in reality, no more allied to the Suffolk, than the buyer might be himself if he were a Hebridean. The only certain plan to go upon, is to make oneself thoroughly acquainted with the approved points of the animal, and rely upon that knowledge rather than upon the declarations of the seller. "If you find a pig," says Mr. Richardson, "possessed of such points of form as are indicative or productive of early maturity and facility of forming flesh, you need care little what it has seemed good to the seller to call him; and remember that no *name* can bestow value upon an animal deficient in the qualities to which I have alluded. The true Berkshire—that possessing a dash of the Chinese and Neapolitan varieties—comes, perhaps, nearer to the desired standard than any other." The chief points which characterise such a pig, are sufficient depth of carcass, and such an elongation of body as will insure a wide lateral expansion. The loin and breast should be broad; the breadth of the former denoting room for the play of the lungs, and a consequent free and healthy circulation, essential to the thriving or fattening of the animal. The bone should be small, and the joints fine. Nothing is more indicative of high breeding than this; and the legs should be no longer than, when fully fat, would just prevent the animal's belly from trailing upon the ground. The leg being the least profitable portion of the hog, no more of it is required than is absolutely necessary for the support of the rest. The feet should be firm and round; the toes lie well together, and press straightly upon the ground; and the *claws* even, upright, and healthy. "Many say that the form of the head is of little or no consequence, and that a good pig may have an ugly head; but the head of all animals is regarded as one of the principal points in which pure or impure breeding will be the most obviously indicated. A high-bred animal will invariably be found to arrive more speedily at maturity, to take flesh earlier, and with greater facility, and altogether to turn out more profitable than one of questionable or impure stock; and, such being the case, the head of the hog is by no means a point to be overlooked by the intending purchaser." It should, therefore, be rather light in bone; not too flat in the fore part, or too long in the snout. "Indeed, the snout should, on the other hand, be short, and the forehead rather convex, recurving upwards; the ear, while pendulous, should be inclining somewhat forward, and, at the same time, be light and thin." Nor should the *carriage* of the pig be overlooked as an indication of the health and spirit of the animal. Of course, if you are purchasing a fat hog for slaughter, or a sow heavy with young, you are scarcely to look for much sprightliness of deportment; but, in young stores, sprightliness is a consideration.

The points of each breed, though generally similar, have still a difference. In the small breeds the hair should be soft and delicate, and short, light, and silky in its texture; nor ought there to be any indications of bristles, or any increased thickness of hair on the top of the neck. The skin should be soft and elastic to the touch; whilst the cuticle should be thin, and almost transparent. A thick cutis is an almost invariable symptom of hardness, and of difficulty in fattening. In the side-view, the frame should have a resemblance to a rectangle. The back should be long, and show nearly a straight line from the rising behind the ears to the setting-on of the tail, with only a slight elevation over the shoulder and ham, to the line, or even above it. This, however, must be so slight as not to present a slack back. When the back is so raised as to be nearly as high as the shoulder-blade and hip-bones, it is a good sign, for there must be room for the active and full play of the vital viscera. The elevation at the back of the ears is, perhaps, the surest indication, as regards form, of the power of the animal to accumulate fat. When there is a fattening tendency in this part of the animal, it may be taken as an almost certain indication that the animal will deposit it elsewhere with facility. The same will take place with the shoulders and the hams, which are the best portions of the animal.

Hence they should have depth enough to give the two ends of the rectangle, which is the desideratum in a well-formed pig. The same remark applies to the throat. It is not naturally fat; but if it descends so as to fill that corner of the rectangle, it is also indicative of the thriving propensity. The chest should be deep and long; and as the belly carries with it a deposit of internal fat, it may be expected nearly to fill that corner also of the rectangle. Such may be considered the principal features of a perfectly formed pig.

It must be further stated, that whether viewed from behind or before, the animal should still present the rectangular view. Looking at it in either of these directions, the back will exhibit a broad and flat appearance, and form the top; the sides will be full, and the hams and shoulders will fill up the angles, and give the base of the rectangle. In conjunction with these marks, the head should be fine and small; while the chaps and upper part of the face should show a full development of muscle and fat, not only because the snout is useless and the chaps valuable, but because the smallness of the former is highly characteristic of a fine quality in the pig, while the latter indicates a power to feed well. The neck should be short and deep; for if flabby and loose, coarseness and grossness must be expected in the animal. The ears should be small, pricked upwards, thin and fine, and either destitute altogether, or very slightly sprinkled with fine soft hairs. The bones should be small; the legs short and fine; and the tail small and curled, as being indicative of a strong back. The eyes should have a bright and mild expression, and all the extremities should be as small, light, and delicate as possible.

In the *large breed of pigs*, there is much that is the converse of this. Here the skin is thicker, the hair stronger and coarser; and though the large animal can grow and thicken, and increase in size, it is not fat only that is accumulated. It is divided with muscle; and hence the bacon is the streaked, marketable article, which is sought after much more than that of the prick-eared animal. This sort of pig is also hardier and constitutionally stronger, and much more able to resist the influences of a cold climate than the smaller animal. Accordingly, in the valleys which intersect the hills, especially of the "backbone of England," this breed is highly esteemed. It is fed on the skim-milk of dairies where butter is made, and on the whey where cheese is the product, and is, therefore, altogether more profitable to the dairy farmer than the small-bred pig. Many efforts have been made to combine the qualities of the two; but, to a certain extent, they have been found incompatible. More rapid feeding and earlier maturity may be gained, at the expense of size, constitutional power, and mottled or streaked bacon.

As types of the smaller and larger breeds, the Leicester pig, or the Essex, will be the most perfect for the former, and the Yorkshire and the Berkshire for the latter. In the purchase of a pig, Mr. Richardson says, that even colour is not altogether to be neglected. "In the case of pigs," he says, "I would, as in reference to any other description of live stock, prefer those colours which are characteristic of our most esteemed breeds. If the hair be scanty, I would look for black, as denoting connection with the delicate Neapolitan; but if too bare of hair, I would be disposed to apprehend too intimate alliance with that variety, and a consequent want of hardihood, which, however unimportant if pork be the object, renders such animals hazardous speculations as stores, from their extreme susceptibility of cold, and consequent liability to disease. If white, and not *too small*, I should like them, as exhibiting connection with the Chinese. If light or sandy, or red with black marks, I should recognise our favourite Berkshire; and so on, with reference to every possible variety of hue. Some judges are much influenced by the colour of an animal. They disregard his make and qualities, and pass him by if he is not *black*. It is true that the black nose in cattle is generally indicative of a want of pure blood, as the white back is in any ox, not a Hereford or an Irish. To so ridiculous an extent was this notion at one time carried, that the best pigs were passed by, at the Show of the Royal Agricultural Society of England, and the prizes given to those which were of the black breed; this being considered an indispensable qualification for a winner. As indicative of breed, therefore, it may be useful to attend to colour; and it may be taken as one point indicative of

quality: the blue spots of Neapolitan; the white, if small, of Chinese; if large, of the old English; if black, of Berkshire, &c.; but beyond this, it is neither politic nor reasonable to go."

PIGGERIES.

For general purposes, an inclosure which allows sufficient space for the number of swine to be kept, with the means of extending it, if necessary, will be found the best; for there are few things which conduce more to the health of the pig family, than spacious, airy, well-constructed, cleanly kept accommodation. At one time, swine were imagined to be far happier when kept in a continual state of filthiness; any place was then deemed *good enough* for them; and the consequence was, that the poor despised animals were housed in dirty, damp, close sheds or sties, without the smallest attention to comfort or cleanliness being bestowed upon them. In such places who could expect the blood of any animal to be preserved for any length of time in a healthy state?

> "The blood, the fountain whence the spirits flow;
> The generous stream that waters every part,
> And motion, vigour, and warm life conveys
> To every moving, breathing particle."

A proper piggery should have a range of sheds, so situated as to be quite sheltered from the north and east winds; from snow and rain; and it should be paved or flagged at the bottom, with an outward slope. To insure cleanliness and dryness, very efficient drainage is absolutely necessary; and it will be advantageous if the bottom be of concrete, as well as drained. "The whole pig-cote should slope towards one corner, and be intersected by channels in the flagstone or pavement: the former is by far the best; and to this a common metal stench-trap should be placed. This is, in every respect, the best. Connected with this drain should be a tank; or it might communicate with the drainage of the rest of the buildings. The interior, or covered shed, should be kept constantly littered; and so, indeed, should the court-yard, if the object of the pig-keeper be to convert his straw into manure. If not, it should be swept and washed clean, and occasionally sprinkled with fresh sawdust. There is no better absorbent—no cleanlier material than this—and it is cheaper than straw, when both have to be purchased; much more portable, easier obtained, carried, or stowed away, and should be the sheet-anchor of the amateur pig-keeper."

Mr. Henderson recommends a house on an entirely different plan. "Have a house," he says, "thirty feet by fifteen, with four doors, all opening outwards, and three partition-walls through the house, by a wall between each of the doors, dividing the house into four compartments—the two middle ones for eating, and the others for sleeping apartments, having an inner door between each eating and sleeping apartment. By this plan, the keeper is enabled to get the eating chambers swept out, and troughs cleaned, and the food put into them, without disturbing the swine, or being disturbed by them. There should be a division-wall through each sleeping apartment. In the hinder part should be the litters; and the front and smaller compartments, through which the animals pass to their food, may be used by them as a kind of necessary; for these animals will never defile their beds, if they can avoid it.

"The manger should be as long as the house is wide, and fixed against the middle wall; in form similar to a horse manger—wide at the top, narrow at the bottom, but not so deep. It must be divided into compartments by partition-boards four feet in length or height, and a little broader than the manger is wide. At such a trough a number of pigs will feed as quietly, and as well, as two or three. Before every meal the trough should be well washed, and the place swept; and once every day a little fresh litter should be placed in the sleeping chambers. Each of the eating and sleeping rooms should be divided into two. The sleeping rooms should be dark, as animals fatten more rapidly when they can quietly lie down and sleep after each meal."—Mr. Parkinson suggests, that in the yard, or inclosure before every piggery, there should be "a rubbing-post, or, what is still more beneficial, two posts, having a hole between them, similar to a horse's leaping-bar, but not revolving; this pole should be raised or let down to the height of the pigs, as the rubbing of the animals against it causes a freer circulation of blood, the same as the flesh-brush does to human bodies." All these plans, however, are suitable only for large farm-yards. For

cottages, therefore, some mode less aspiring should be adopted.

In this case, a well-built stand, and waterproof shed for a sleeping-place, with an inclosure for air and exercise, as large as convenient, will be sufficient. It should not open to northerly or easterly winds; nor should it be exposed to the full heat of the mid-day sun. Its dimensions should be about eight feet square, and the court about ten. The second, or supplemental sty, need not be more than six feet square; and it does not necessarily require a court. Of course, if the three mud walls can be built, and a little gate appended for the ingress and egress of the tenant, it will be so much the better; but here cottier management only is spoken of. In constructing cottier pig-cotes, it is hardly necessary to say that the roof should always slope from the court and behind the sty, or be spouted in such a manner as to allow the water to be carried off by a system of drains entirely separate from those conveying the liquid from the sties.

CHAPTER IV.

BREEDING REARING, FATTENING, AND FEEDING THE HOG.

It is now a fact admitted in the principles of breeding, that the progeny usually inherit the physical and constitutional qualities of one or both of the progenitors; and in the case of the hog, it is the qualities of the boar which principally predominate in the offspring. Hence the male animal, in swine, should always be selected with the utmost care. "In the breeding of swine," says Thaér, "as much as in that of any other live stock, it is important to pay great attention, not only to the breed, but also to the choice of individuals. The sow should produce a great number of young ones, and she must be well fed to support them. Some sows bring forth ten, twelve, or even fifteen pigs at a birth; but eight or nine is the usual number; and sows which produce fewer than this must be rejected. It is, however, probable that fecundity depends also on the boar. He should, therefore, be chosen from a ram that multiplies quickly. As good one-year bacon-hogs are much in request, we must do all we can to obtain a breed well adapted for producing them. Swine of such a breed may be known by their long bodies, low bellies, and short legs. Long pendulous ears are usually coupled with these qualities, and attract purchasers. If, however, as is often advisable in large dairies and cheese factories, hogs are to be sold at all seasons to the butchers, great attention must be paid to quickness of growth and facility of gaining flesh, so that the animals may attain their full growth, and be ready for killing before they are a year old. This quality is particularly prominent in the Chinese and African breeds; but among our ordinary varieties, hogs are often met with which are better adapted for this purpose, than for producing large quantities of bacon and lard. The boar should be selected from a breed well suited to these several purposes. He must be sound, and free from hereditary blemishes. He should be kept separate from the sows till he is about a year old, and has finished his growth, or he will begin to leap too early. He is usually castrated before completing his third year, otherwise his flesh becomes uneatable. If, however, he is of a peculiarly excellent breed, one which cannot be easily replaced, his flesh may be sacrificed for the sake of preserving him for breeding from, a few years longer. A boar left to pasture at liberty with the sows, might suffice for thirty or forty of them; but as he is generally shut up, and allowed to leap at stated times only, so that the young ones may be born nearly at the same time, it is usual to keep one boar for ten or twelve sows. Full-

grown boars being often savage, and difficult to tame, and attacking men and animals, must be deprived of their tusks. The sow must be chosen from a breed of proper size and shape, sound, and free from blemishes and defects. She should at least have twelve teats; for it is observed that each pig selects a teat for himself, and keeps to it; so that a pig not having one belonging to him would be starved. A good sow should produce a great number of pigs, all of equal vigour. She must be very careful of them, and not crush them by her weight; above all, she must not be addicted to eating the after-birth, and what may often follow, her own young ones. If a sow is tainted with these bad habits, or if she has difficult labours, or brings forth dead pigs, she must be castrated forthwith. It is, therefore, proper to bring up several young sows at once, so as to keep those only which are free from defects. Breeding-sows and boars should never be raised from defective animals."

These observations comprise much that is excellent in connection with the principles of breeding; and they might be greatly extended, although it would be a work of repetition. It may be observed, however, that, in every case, whether bacon or pork be the object of the breeder, a spirited-looking head, a deep and broad chest, ample ribs and barrel, a haunch almost as low down as the hough, broad loins, wide hips and long body, in proportion to the height, are the qualifying points of a good animal. The back should also be broad, and the flesh abundant, round, and behind the ears. Smallness of bone is also one of the first considerations, and should be taken into calculation with the proportion of flesh, fineness of the best parts, and the lightness of the offal.

Breeders are not altogether agreed as to the exact age for the boar and the sow to commence breeding at. In speaking upon this point, Mr. Richardson advises that the sow should be at least one year old, and the boar at least eighteen months; but, if the former have attained her second year, and the latter his third, a vigorous and numerous offspring are more likely to result. The boar and sow continue to breed for about five years; or until the former is upwards of eight years old, and the latter seven. A boar should not be used after he has passed his fifth year, nor a sow after she has passed her fourth, unless she has proved a peculiarly valuable breeder. In such a case she might be suffered to produce two or three more litters. When the services of the boar are no longer required, he should be emasculated—an operation that can be performed with safety at any age—fattened, killed, and sold. When it is no longer desirable to breed from the sow, she should be killed also. Perhaps the most saving plan, where the breeding and fattening of pigs are carried on simultaneously, is to take no more than three litters from a sow before she is killed. If less are taken, she will not have attained her full maturity; if more, she will prove injurious for bacon. A sow that has had only three litters, will be as fine bacon as an emasculated hog; but, if she has had more, the flavour of her flesh will be coarse and strong. Should a sow exhibit a more than ordinary tendency to take on fat, she should be bred from at an early age—say at about nine months—as the rapid accumulation of fat in the animal is attended with danger at the period of parturition. She should be allowed the boar a couple of months after pigging, and permitted to breed as frequently as she is capable of doing. This will effectually check her fattening tendency. After having taken a few litters from her, the rapidity with which she will consume her food, will soon bring her into condition for the butcher. The boar should be well fed, in order that he be kept in high condition without being fat. On the other hand, till after conception has taken place, the sow should be kept rather low; but after that, she should be gradually brought up to good condition.

For successful breeding of swine, the best times are in the month of April and the beginning of August. After this period, the litters being farrowed late, they have a good deal to contend with regarding the inclemency of the weather; consequently they do not always turn out profitable. Indeed, some assert that the litter, either from accident or some other cause, is not worth keeping. Should, however, a late litter be brought into the world, the best plan is to trust them entirely to the care of the sow; and both her and them should be well fed on warm stimulating food. This will secure good pork at a period when that

commodity is both scarce and high-priced, and when a paying profit may be obtained upon it. This is the only plan to realise some benefit by a late litter. The time which the sow carries her young is about 113 days, or sixteen weeks. This is our observation; but a French gentleman, of the name of M. Tessier, affirms, that from his having carefully observed the period of gestation in twenty-five sows, he concluded that it varied from 109 to 143 days. Be this as it may, however, the young produced average from eight to thirteen, and sometimes even more at a litter. We have heard of one sow producing, in thirteen litters, no fewer than 301 pigs; and of others exhibiting an extraordinary degree of fecundity; but it is questionable if this is desirable, as the pigs are generally much smaller than those that form the aggregate of litters less abundant. When giving suck, the sow should be well fed, as she has then a craving appetite for both meat and drink; and which, if properly satisfied, will keep both her and her pigs in good condition. This is an important point; for, if the mother is allowed to become lean, it will require double the quantity of food to enable her to get into condition again; and the young ones, if suffered to degenerate, will not only require extra feeding and time before they can be brought to market, but will never make such good swine as they would have done had they always been kept up to a proper standard. "To guard against such evils," says Mr. Henderson, in his *Practical Grazier*, "let the sow and her progeny be fed three times a-day with milk and wheat-bran, or something similar. Water, a little warm, may be substituted for milk, when it is scarce or too valuable. The mixture, of whatever kind, ought never to be thick, but should be more of the nature of a drink than anything else. After the pigs are about ten days old, if the weather is mild, they ought to be allowed to stretch their legs a little, once a day, in an open court attached to their house; during which period the sow may be turned out from them, which will contribute very materially to the supply of milk; but care must be taken to avoid the sow's remaining out from them all night. Feeding as above will be found very beneficial almost in every case; but more especially when a sow brings forth more than she is able to support, which is not unfrequently the case. It is likewise of great importance to accustom pigs to food when sucking, as such will prevent their taking the 'weaning brash.' When the pigs are about a month old, such as are not intended for breeding should be castrated or spayed."

As some sows are apt to lie upon, and thereby destroy their young, it is better to keep such from getting too fat, and to have the straw of her bed short, and not too much in quantity. It has been suggested by some, to put an inclining or projecting rail to the lower part of the interior wall of the sty, that the pigs might run through between the rails, and make their escape if the mother attempted to lie upon them; but whether this plan would be successful we cannot say, as we have never seen it tried, although we believe such has been the case. Before weaning the pigs they should be gradually fed; and should they and their dam have been kept warm and dry, and well supplied with drinks moderately warm, mixed with a little meal or wheat-bran, the young ones may in general be weaned when they are six weeks old. Should they, however, have been neglected, they will require to be left with their mother two weeks longer, and even then will not be in such good condition as they otherwise would have been, had they received a sufficiency of food for six weeks. If the pigs are intended for sale, this is the time that they should be driven to market, as they have then a better appearance than they would have for many weeks after being weaned. After they have been taken from the sow, it is necessary that she should be well fed for ten days with boiled potatoes, meal, oats, &c., which, in a short time, will stimulate coition, and the proper season for bringing forth her young will not be lost. After weaning, the pigs must be regularly fed three times a day, with similar food to that recommended to them while sucking, and in a few weeks they will begin to eat raw potatoes or grain. The author of *The Pig* says, that young pigs should be gradually fed before they are perfectly weaned; and recommends milk for their first food; which, he says, "may be succeeded by ordinary dairy wash, thickened with oat or barley meal, or fine pollard; and this is better scalded; or, better still, boiled. To the sow some dry food should be given

once daily, which might consist of peas or beans. Swedish turnips, carrots, parsnips, or the like, either well boiled or raw, may be given; but a preference should be shown for the food *always* boiled, or, what is better, *steamed*. Some wean the pigs within a few hours after birth. It can hardly be conceived under what circumstance this may be found advantageous. The best mode of management is clearly to turn the boar into the hog-yard a month or two after parturition, at which time it is proper to remove the sows for a few hours daily from their young, and let them accept his overtures when they please. It does not injure either the sow or her young if she take the boar while suckling; but some sows will not do so until the cessation of their milk; and this is much more natural. At weaning-time the young pigs may be rung. After about five weeks' high and careful feeding, subsequent to weaning, the young pigs may be put up for stores, porkers, &c., according to the owner's views respecting them. Very young pigs, indeed, immediately after being weaned, if fed on the refuse of a dairy, can be brought up for delicious pork in five or six weeks; for the last week, prior to killing, the addition of beans, peas, or bruised corn, will impart a degree of firmness to the flesh, which is considered an improvement. This is called "dairy-fed pork," and it never fails to fetch an enhanced price, thereby amply remunerating the producer."

When pigs are intended for pork, they should not be so highly fattened as those which are destined for bacon. This should especially be the case with such animals as are designed for home consumption, or, in other words, domestic purposes. To the feeder whose object is to sell, however, a different line must be pursued. What he wants is fat, because fat produces weight, and weight yields profit. It is questionable, however, even whether he should feed the animals till they attain the enormous state of obesity to which we see them brought and exhibited for sale. "There is," says Hurtrel D'Arboval, "no animal so liable to become over-fat as the pig, and especially the Chinese and Siamese swine. Naturally inclined to corpulence and gluttony, they easily acquire an enormous bulk; and when fat has once begun to accumulate, the animal eats little, breathes with difficulty, becomes inert, unable to sustain its own weight, and deficient in sensation. We have seen wretched pigs so fat that they were obliged to be lifted or dragged out of the sty whenever it was necessary to move them. We have, also, made incisions in their buttocks, and even taken off portions of skin from their backs, without their betraying any sense of pain. We saw a hog that had lain for a considerable period on one side, too powerless or too inert to shift its position; and when it was raised, a large hole was perceived in that part of the back which had been undermost. This had been made by rats feeding and gnawing into the fat of the beast, evidently without its being in the least conscious of their proceedings." When fattening pigs for bacon, they should be kept by themselves, as they require no liberty. Their sties, however, should be kept nice and dry, and clean; whilst, in order to bring them into the condition required for the knife, they should be abundantly fed. It seems almost ridiculous to talk of the cleanly comforts which ought to be extended to the pig; but if its accommodation be not attended to in every way to make it feel comfortable, it will not thrive so fast or so well as it would otherwise do. Whilst speaking of pigs being fattened for bacon, Parkinson says, that when he lived with his father, acorns were so plentiful in the woods one year, that they made the pigs sufficiently fat for bacon without any other food. The flesh was equally good, and as well flavoured as that of other animals which had been fed on beans and peas. In the United States, when apples and pumpkins are abundant, the swine are fed on these fruits, which are considered excellent for them. A breeder says on this subject, that on the 10th of October, twenty swine were put up to fatten, all of which were only in middling store order, in consequence of the scarcity of food. The cows producing very little wash from the dairy, and the crops of apples being scanty this season, they had only, during summer, the free range of a small orchard containing an acre and a-half of land—with the premature apples which fell—in which was a pond of water; a very essential requisite to hogs, and one to which, under the powerful influence of the sun, they will resort for their chief

comfort. These twenty swine were divided into three lots, and closely confined; we proceeded to fatten them, by steaming four bushels of small potatoes, twelve bushels of apple pomace, four bushels of pumpkins, and one hundred-weight of buck-wheat cornel, adding a little salt; the whole being well incorporated together, while hot from the steamer, with a wooden pounder, and suffered to undergo fermentation before it was used as food. They were, at the same time, supplied with plenty of charcoal and pure water. While feeding them with the first steamer, or the compound, a more than ordinary moisture was observed on their litter, which was occasioned by urine: a knowledge of animal nature convinced the owner, that any more than an ordinary flow would weaken the system, and retard the progress of fattening; and he attributed this evil to the steamed pumpkins acting as a diuretic, stimulating the kidneys, and increasing the evacuation of urine. In the next steamer, therefore, four bushels of ruta-baga were substituted for the pumpkins, and this had the desired effect. The experiment afforded proof that a mixture thus compounded, contains a larger mass of nutritive material ready prepared for the action of the stomach, and therefore producing flesh more rapidly, than any other combination of food made use of.

Professor Johnston furnishes a table of the comparative nutritive elements of different kinds of food; and from which we take the following materials used in the feeding of the pig:—

	Heat-producing: Starch, sugar, gum, &c.	Flesh-and-bone-producing: Gluten, albumen, legumen, &c.	Fat-producing: Fatty matter.
Wheat	55	15	3 per cent.
Barley	60	14	2 ,,
Oats	60	16	6 ,,
Rye	60	13	3 ,,
Indian corn	70	12	7 ,,
Rice	75	7	0·7 ,,
Beans	40	26	3 ,,
Peas	50	24	2·1 ,,
Potatoes	18	2	0·3 ,,
Turnips	9	1·5	0·3 ,,
Carrots	10	1·5	0·4 ,,
Mangel-wurzel	11	2	,,

A food, formed of the combination of roots —say potatoes and grain, as oats—is generally chosen by the best pig-feeders for fattening large pigs. The Rev. Arthur Young, in his work on fattening cattle and swine, gives the following directions in reference to the best method of using grain as a meal for this purpose:—"The most profitable method of converting corn, of any kind, into food for hogs, is to grind it into meal, and mix this with water in cisterns, in the proportion of five bushels of meal to one hundred gallons of water; stir it well several times a-day, for three weeks, in cold weather, or for a fortnight in a warmer season—by which it will have fermented well, and become acid; till which time it is not ready to give. It should be stirred immediately before feeding. Two or three cisterns should be kept fermenting in succession, that no necessity may occur for giving it not duly prepared. The difference in profit between feeding in this manner, and giving the grain whole, is very great—so great, that whoever tries it once, will not be apt to change it for the common method." In another portion of his work, the same author observes —"Some persons appear to be exceedingly successful in fattening their pigs on bread made of coarse rye or barley-meal. They cut this bread in pieces; dry it in an oven; then soak it in water, mash it, and give it to the animals in the form of porridge. Where sour milk or whey can be substituted for water, this food is said to surpass all others for quickness and efficacy in fattening, and for the goodness of the flesh and the fat it produces."

Wheat-meal is not so well relished as oat-meal, because, from its glutinous character, it sticks to the teeth of the animals, and thus annoys them; and all annoyances do harm to fattening animals. For store pigs, nothing more is necessary than the pickings of the fold-yard (especially where cattle are fed on linseed cake; for they will carefully collect all the dung in this case, and feed upon it), with a few chopped turnips and a little sour wash in winter. In summer they may be given a run in the grass fields, with a little wash, in which almost any refuse may be thrown. As the pastures fail, and before the stubbles are ready, a handful of old dry beans in the morning, per animal, will exercise a very wonderful influence for the better; the binding character of the beans will counteract the too-relaxing wash and grass; and, when the harvest

is over, the stubbles are a very valuable auxiliary. When these are finished, the pigs should at once be put up to feed; and at first a large quantity of roots may be given. It is a great satisfaction, then, that diseased potatoes will not only have no injurious tendency on either the live animal or its bacon, but will be almost, if not altogether, as fattening as when they are sound. Hence the value of a stock of pigs. As the feeding progresses, barley or oatmeal should be given in increasing proportions; and, as the process becomes more nearly completed, the whole of the roots may be abstracted with advantage.

When the pig gets too heavy to stand, in the west of Yorkshire they give him oatmeal balls, made just dry enough to hold together; and the display by the porcine tun-bellied mammoth, as he lies, eats, and sleeps, with the evident satisfaction he evinces, shows that they are no bad judges of his appetite. Boiling and steaming the food is absolutely essential to pigs. Their digestive powers being by no means strong, they partake of the sluggishness of their general organism. Hence they must have their roots broken down by steam or boiling, and their grain not merely crushed, but absolutely made into flour.

Position, circumstances, and price, will often decide the kind of food given to pigs; and those who make pig-feeding a business, and consequently keep a number of them, should so manage as to be enabled to provide for their maintenance and fattening from the produce of their crops. "They should therefore cultivate, for pig-feeding, beans, peas, barley, buck-wheat, potatoes, flax, parsnips, carrots, lettuce, lucerne, rye-grass, Italian clover, rape, chicory, and vetches; they should also sow thistle—which is a most nutritious article of diet for pigs; but so much neglected, that it is, as yet, scarcely ever to be met with in a state of cultivation, or in any condition but that of a weed. Nor ought we to forget a most important article of porcine dietary—namely, mangel and Swedish turnips."

"Until this last year," says an anonymous writer in the *Farmer's Gazette*, "I was in the habit of giving them steamed potatoes, with a portion of broken corn, and now and then bean-meal. The latter article I have used very little, as beans are seldom grown in my district, except by the landed proprietors, and a few extensive farmers. I resolved this year to try, for experiment, if pigs could be fattened on Swedish turnips; and am happy to say, at present, my herd are fattening as well as they were this time last year, when they were consuming a great quantity of potatoes. Hay being so scarce this year on my small farm, I should have been obliged to buy a considerable quantity, had I not changed my mode of feeding. The potatoes my pigs ate last year, I am able to give to my horses and cows, thereby saving my hay; and I have no doubt but pigs can be fattened as well, though not, perhaps, as quickly, on steamed Swedish turnips. I give them as much as they can eat of the turnips, mixed with a little broken corn and wheat chaff, with about a pint of buttermilk to every three pigs; and I have every reason to expect, judging from their present improvement, that they will be ready for market about a fortnight later than I had them last year, and at, at most, one-half the expense. I bought them in the beginning of December, for about £2 a-head; and, if they continue to improve as they are doing, I have no doubt but they will average from 4 to 4½ cwt. at Christmas," &c.

Rice is, also, an important article used in porcine dietary. An amateur pig-breeder says—"We purchased from the government stores several tons of damaged rice at a very cheap rate; with this we fattened our pigs; and such pork I never saw before or since. The fat was as firm and solid as the lean, and the flavour of the meat very superior. The way in which the rice was prepared as food was as follows:—My copper held forty gallons; in the afternoon it was filled, or nearly so, with water; as soon as the water boiled, the fire was raked out, two pails of rice immersed in the water, and the whole covered close down, and left to stand until the morning. On the following day the copper was emptied of its contents, which consisted of a thick jelly, so firm as only to be taken out with a shovel; and on those contents the pigs were fed. The effect was perfect. As to the economy of the plan, that, of course, must be a matter dependent upon circumstances; we found it more profitable than almost any other kind of food we could have given, from the price at which

we were able to purchase the rice, and its goodness. From slight experiments, I am induced to think that equal parts of rice-jelly and mashed potatoes would constitute an excellent food." Hay-tea is another advantageous kind of feeding, of which we have an account given by Mr. Richardson. The article was first publicly announced by Mr. Saunders, of Stroud, in Gloucestershire. This gentleman was induced to try it with pigs, from having observed its efficacy in weaning calves; and the result was laid before the public in the columns of the *Agricultural Magazine*. In the manufacture of his tea, he employed various sorts of qualities of hay. The most suitable were found to be clover, sainfoin, and lucerne. The tea produced from an infusion of these plants was thickened with grains, pollard, bran, any kind of meal most abundant at the time, boiled cabbages, or potatoes; but he had no carrots, or he would have used them. Mr. Saunders generally compounded several of these ingredients into a mess, and found that one sack of potatoes, thus used, went as far in feeding as four or five bags given in an unmixed state; the expense being also greatly reduced. He gradually increased his stock of swine to the number of 400, and, in the course of his experiments, used upwards of 1,500 hogsheads of wash, or about five hogsheads daily. His swine were thus maintained at a rate somewhat under one penny per day for each—were in excellent condition, and many, indeed, ripe and ready for the butcher. He had previously been feeding them on potatoes alone; and after he resorted to this new method of feeding, he, within a week or fortnight, found his stock not only improved in coat and skin, but in general health and condition. Mr. Saunders used to store his potatoes, after having them steamed, in casks carefully closed; and found that, thus stored, they were preserved sweet for twelve months, and fermenting, generally, a sort of spirit, which, as it promoted sleepiness in the swine, conduced to their acquiring fat with more than ordinary rapidity, as well as giving to the pork a peculiarly rich and delicate flavour. One sack of meal was thus found to go as far as two under the old system; and he found also, that thickening the wash gradually with meal, formed the best introduction to what are generally known as the higher and last stages of the process of fattening. In Mr. Saunders' calculations, he did not take the manure into consideration at all; but had he done so, of course, even his estimate of one penny per day for the feeding of one pig, would have been considerably reduced.

Indian corn is another article employed in fattening the pig. Professor Voelcker says that it is richer in fat-forming matters than any other description of food. The ready-made fat, in corn, amounts to from five and a-half to six per cent.; but animals should not be fed entirely on Indian corn, because the flesh-forming matter in it is small. Bean-meal supplies the deficiency. Five pounds of Indian corn, ground or crushed, to one pound of bean-meal, is a mixture which contains the proportion of flesh-forming and fattening matters nicely balanced. Flax-seed is also used for fattening swine; "but," says Mr. Richardson, "such as have adopted it, have not found it to answer nearly so well in the crude state as in boil, previously kiln-dried, and well crushed, so as to crack the seed; otherwise the animal will pass a large proportion of the seed in a whole state. The whole seed also acts as a purgative and diuretic—qualities which will be seen to be opposed to the secretion of fat. To prepare the bolls for food, steep them for twelve hours in water, which may be poured on them in a tepid state, but not at boiling heat; and, prior to giving the mess, add as much lukewarm wash as will bring it to the consistence of gruel. This wash may be produced from brewer's grains, or simply from mangel or Swedish turnips, well boiled and smashed, and given with the water in which they have been boiled. The addition of a proportion of bran improves the mess; and, when at hand, it should not be omitted. The adoption of hay-tea, as the vehicle for mixing these ingredients, will be found also advantageous. Do not *boil* the flax bolls. Boiling will produce a coarse, tough, and not very digestible mass; but steeping, on the contrary, furnishes a rich and nutritious jelly. Linseed-cake is a good substitute for the bolls; and it is to be given in the proportion of a stone, substituted for seventeen or eighteen pounds of ground bolls. Neither the linseed-cake nor the bruised bolls

should be given, except in combination with a large proportion of other substances, as they are of a very greasy nature, and are apt to impart a rank flavour to the flesh, if given in an unmixed state; and are, besides, actually more efficacious in combination. If there is plenty of meal, the addition of a little to one of the daily feeds will be found to tell well, especially towards the close of fattening, a few weeks previous to transferring your stock to the butcher. The refuse of mills also forms a very valuable item in swine-food, when mixed with such boiled roots as have been enumerated; or as what are called starch-sounds, the refuse from the manufacture of that article; and also the fibrous refuse remaining from the manufacture of potato starch." In treating of this subject, we must not forget to notice the important experiments made by B. Lawes, Esq., on the chemistry of pig-feeding; and published in the fourteenth volume of the Royal Agricultural Society. This Essay is of the greatest value to the scientific agriculturist; but for general perusal, is, perhaps, too elaborate. The food employed in the experiments made by this gentleman, comprised—

1. Equal weights of beans and lentils.—2. Indian corn.—3. Bran.

The food was accurately weighed, and the animals were, every fourteen days, put into the scales. For the first series of experiments, thirty-six animals, of the same character and age—about ten months—were bought and separated into lots of three each. They were then inclosed in twelve pens, and, for twelve days, fed alike; but afterwards changed from pen to pen, and the evil-disposed, or quarrelsome ones, whipped, so that they might all be brought into a sufficiently agreeable state, to start fair in the feeding experiment for weight. When this had fairly commenced, twelve dietaries were prepared from three standard foodstuffs, and arranged in the following order:—

Pen 1.—Of bean and lentil mixture, an unlimited quantity allowed.

Pen 2.—Two pounds of Indian corn to each pig per day; of beans and lentils, unlimited.

Pen 3.—Two pounds of bran per pig per day, and beans and lentils unrestricted.

Pen 4.—Two pounds of Indian corn, two pounds of bran, and the beans and lentils unrestricted.

Pen 5.—Indian corn alone, in unlimited quantity.

Pen 6.—Two pounds of beans and lentils, and an unlimited quantity of Indian corn.

Pen 7.—Two pounds of bran per day, and an unrestricted quantity of Indian corn.

Pen 8.—Two pounds of bean and lentil mixture, two pounds of bran, and unlimited Indian corn.

Pen 9.—Two pounds of bean and lentil mixture, with bran unlimited.

Pen 10.—Two pounds of Indian corn-meal, and bran unlimited.

Pen 11.—Two pounds of bean and lentil mixture; two pounds of Indian corn, with an unlimited quantity of bran.

Pen 12.—Bean and lentil mixture; Indian corn-meal and bran; each separately and unlimited.

To render this food more palatable it was mixed with water, and the animals were fed with it three times a-day—early in the morning, at noon, and at five in the evening. In the first two feeds, a small quantity of the food which was to be given *ad libitum*, was mixed with that which was limited, and care was taken that the pigs should always have a liberal allowance within their reach. The troughs were also carefully cleaned out before a fresh supply of food was put into them.

Three sets of pigs having been portioned off, and put into twelve pens, containing three each, they were subjected to three series of experiments, with the various proportions of the food mentioned. In one series, barley-meal took the place of Indian corn; and the third series was devoted to the trial of dried Newfoundland cod-fish, in connection with the other food named. The quantity given varied from one to two pounds of cod-fish per day. In all cases it was boiled, and a portion of other food mixed with the soup thus obtained. The more simple conclusions at which Mr. Lawes arrived are as follow:—"Indian corn, or barley-meal, given with a liberal supply of bran, is good; the bran contributing to the value of the manure. When the animals had unrestricted access to three kinds of food—namely, to the highly nitrogenous false mixture, the non-nitrogenous Indian meal, and the moderately nitrogenous bran—the proportion of their first week's consumption was gradually discon-

tinued as they approached maturity; and, throughout, consumed only five per cent. of bran. The average consumption of corn, per pig, per week, was sixty pounds, or about nine pounds per day, which yielded from ten to twelve pounds of meat per week, or about one-and-a-half pounds per day. As the animal fattened, a considerable reduction took place in the consumption of food. The nearer it approached to maturity, the greater was the proportion of fat in the gross increase obtained. On the whole, it was found—"That the larger the proportion of nitrogenous compounds in the food, the greater was the tendency to increase in frame and flesh; but that the maturing or ripening of the animal—in fact, its *fattening*—depended very much more on the amount of certain digestible non-nitrogenous constituents in the food. It also appeared that some of the cheaper, highly nitrogenous foods, would produce a given amount of gross increase more economically than the expensive ones (peas, beans, &c.), which are usually preferred by pork-feeders. If the amount of gross produce of meat, in return for a given amount of food of a given money value, is alone to be taken into consideration, then, in addition to roots, wash, &c., it would be most advantageous to rely for fattening upon highly nitrogenous foods, such as dried fish or animal refuse, or leguminous seeds, beans, lentils, and the like; because, not only would the weight be obtained at less cost than by the use of cereal grains, but the manure, the value of which must never be lost sight of in calculating the economy of the feeding process, would be much richer than if the latter were employed. But it is not a large amount of gross increase that makes the farmer's profit upon his sties. When pigs are fed freely upon highly succulent food, such as cooked roots, the refuse of starch, herbs, and the like, they are frequently found to give a very rapid increase. But pork so fed is found to sink rapidly in the salting process, and to waste considerably when boiled. And, although the first batch of pigs so fed may fetch a good price, their character is at once detected, and the market closed against a second sale. On the other hand, when pigs are fattened upon the highly nitrogenised leguminous seeds—peas being, however, much less objectionable than some others—the bone is hard, and the fat wastes in cooking. Fish, flesh, and strong oily matters, give the pork a rank flavour. Finally, it is the interest of the farmer to use highly nitrogenous leguminous seeds, and even refuse flesh, if at command, during the earlier and growing stages of his bacon hogs. But if a constant market is to be secured for pork, barley-meal, or other cereal grain, must supersede everything else as fattening proceeds."

Such were the general conclusions arrived at by Mr. Lawes, after he had made a series of the most elaborate experiments which were ever entered upon by any scientific pig-breeder whatever; and we are all aware that swine are often kept and maintained by butchers, mostly upon such garbage as entrails, the paunches, lights, and the viscera of sheep and cattle, as well as the blood. The pig being omnivorous, hardly any kind of food comes amiss to him; but, when the animal is not fed upon choice or selected food, his flesh becomes both rank in smell and taste, and is easily recognised as not having been nourished by a vegetable dietary. Pork-butchers, resident in large towns, usually feed their pigs with their garbage, and not unfrequently help greatly to support one pig by the offal of another. This practice is very disgusting; and, if it were generally known, we believe that there would be much fewer purchasers of pork than there really are. Mr. Richardson says that there is yet another kind of pig-feeding, which has a great tendency to produce revolting sensations. It is that of feeding swine in knackers' yards. "The animals are kept by these persons in considerable numbers, and are fed wholly upon the refuse of the dead horses—chiefly the entrails, the carcass being in too great demand among those who keep dogs to permit of its being unnecessarily wasted. I have frequently been disgusted by the sight, in one of these yards, of three or four fierce, wolfish-looking hogs, their muzzles plunged to the eyes in the abdomen of a slaughtered horse, and their savage jaws dripping with gore. Nor are these horses always *fresh*. I have witnessed the swine, on more than one occasion, revelling in *corruption*, and disputing with the maggot and the worm the possession of a mass of liquid putrefaction. In Paris this shocking practice has been long known; but where the *knackers*

themselves are in the habit of regaling on the choicest morsels, can we wonder that they should fancy the less dainty portions of the same old carrion good enough for hogs? In the yards attached to many of the continental schools of veterinary science, a similar, but, if possible, more disgusting spectacle is constantly to be witnessed. While such a practice is tolerated, with what caution should we not purchase bacon or pork, lest we should thus eat, at second-hand, of substances so revolting to the feelings, so dangerous to individual and public health! Whether knackers should be permitted to keep swine at all, is, indeed, a question; for, without an express prohibition to that effect, issued by the higher powers, I do not see how the evils of which I have spoken could possibly be removed. Chandler's greaves are likewise objectionable as food for swine, unless given in comparatively small quantities, and mixed with bran-meal and boiled roots. If fed wholly on either greaves or oil-cake, or flax-seed, the flesh becomes loose, unsubstantial, and carriony, and gives out a flavour resembling that of rancid oil."

Pigs that have been fed chiefly on corn, alternately with the vegetable diet, yield pork nearly equal in delicacy of flavour, whiteness of colour, and consequent value, to that well-known delicious article, dairy pork. When swine are not of very large size, and it is desirable to raise pork rather than bacon, a very economical mode of feeding may be advantageously adopted. It consists of equal parts of boiled Swedish turnips and bran. If it be desirable to render the accumulation of fat a little more rapid, let oatmeal be substituted for bran.

We have more than once spoken of the great requisite of cleanliness to the well-being of pigs. A hog washed weekly with soap and a brush, will be found to thrive, and take on flesh in a ratio of at least five to three, in comparison with one not so treated. This has been proved. There can be no possible question about its correctness; and, as it is not a very difficult operation, neither involving a great deal of time or much cost, it should be attended to. Surfeiting hogs is an evil as well as starving them. Illustrative of this, the following anecdote is adduced by Mr. Moubray:—"Four or five-and-twenty years ago, the late Mr. Tattersall requested of me to choose him a store-pig, to put up for fattening. I applied to Mr. Wyat, the then salesman, and we chose one at Finchley, out of a fine drove of *Herefords*, not then out of fashion. After the hog had been at Mr. Tattersall's two or three days, I received a letter from him, to tell me it was taken very bad—in fact, dying. On inspection, I found the animal sleepy and torpid, refusing food, but occasionally throwing up the contents of its stomach, which consisted of half-digested meal. I immediately perceived the cause of the patient's malady. The feeder, determined to lose no time, had been assiduously filling the trough with food. The hog being empty, after a long journey, voraciously devoured it, until its stomach was filled, and its digestive organs totally overpowered. My prescription was, abstinence from corn, a moderate quantity of sweet grains, thin wash, and sulphur with it: in a few hours the hog was perfectly recovered. In the sequel, the feeder held up his hands with astonishment at the possibility of a hog being gorged with food."

Many examples might be given of the great weight attained by pigs, when they have been skilfully fed and properly attended to. A Mrs. Snarbrich, of Naseby, is instanced as having fed a pig, which, eight weeks before she was publicly noticed, farrowed nine fine young pigs, which were sold in Garstang market for £7, being five weeks old, and this her second litter. The former litter realised the same sum; and, when slaughtered, the sow weighed thirty-four score, which realised, at 8*s.* per score, £13 12*s.*; which, by adding the £14 for the two litters of pigs, makes the value of this pig amount to £27 12*s.* This was a profit of more value than could be made from a fat cow in the same neighbourhood.

The following was the mode of feeding adopted:—"Profit was the great object of the feeder of the pig slaughtered by Mr. Eccleston, of Garstang; and it would have well repaid keeping for a few weeks longer; but Lent being at hand was the reason why it was not kept. Here, in this experiment, is a clear proof that it is better to keep pigs more than one year for profit; and it is well known that there is little gained by feeding an old sow. The food of this pig had been principally whey, as in this neighbourhood there are large quantities of cheese made, and the whey is excellent both for pigs

and calves; and if it was not for them it would not be consumed. To this whey were merely added what waste and leavings were made in the house, or what is called the *swillens*. When she had the young pigs, she had about 12 lbs. of oatmeal allowed the first week, which was made into porridge. The mode of feeding for fattening was on oatmeal and potatoes. The latter were boiled by themselves; to 21 lbs. of meal were added 7 lbs. of potatoes, they being boiled to a complete jelly, and then mixed with the meal, and made into balls. It consumed 90 lbs. of meal, and 30 lbs. of potatoes per week, with whey and water to drink; so that in eight weeks it consumed 720 lbs. of meal, the price being 1¼*d.* per lb, and which, therefore, amounts to £3 15*s.*; and the 30 lbs. of potatoes per week, amounts to 240 lbs., which, at ¼*d.* per pound, amounts to 5*s.*; and there were also 20 lbs. of wheat bran given to it at different times, to keep its bowels open; the price of this bran was 1*s.* 2*d.*; and for 24 lbs. of meal, given to it when it had the young pigs, 2*s.* 6*d.* The price of the pig, at first, was 12*s.*: which makes the total amount laid out on this pig, to be £4 15*s.* 8*d.*; and, therefore, by deducting this sum from the £27 12*s.*, the produce, it leaves a clear profit of £22 16*s.* 4*d.*, besides the valuable manure it must have made in the course of the two years."

The following cautions, which we have slightly altered, in conjunction with the directions already given relative to feeding, are suggested by Mr. Richardson:—

Avoid foul feeding. No food fit for the table can proceed from unclean feeding.—*Add salt*, in moderate quantities, to the mess given. It is advantageous to do this.—*Feed at regular intervals.* Nothing is more essential to a healthy animal. Without this precaution, all other attempts at cleanliness will be in vain.—*Cleanse the troughs previous to feeding*, by washing out carefully.—*Do not overfeed.* Give only as much as will be consumed at the meal. Never allow any to remain in the trough: clean it out for the store pigs.—*Vary the bill of fare.* Variety will create, or, at all events, increase appetite; and it is, farther, most conducive to health. These *variations* should be guided by the state of the *dung cast*: this should be of medium consistence, and of a greyish-brown colour. If *hard*, increase the quantity of bran and succulent roots. If too liquid, diminish or dispense with bran, and give beans or acorns, and let the mess be firmer. If a portion of corn can be added, such as may have been spoiled, and rendered unfit for other purposes, it will be found to answer perfectly well.—*Feed stock separately*, in classes, according to their relative conditions; keep sows in young by themselves; stores by themselves; and bacon pigs and porkers by themselves. It is not advisable to keep stores too high in flesh; for high feeding, however strange it may seem, is calculated to retard development of form and bulk. It is better to feed pigs intended to be put up for bacon, *loosely*, and not too abundantly, until they have attained their full stature. They can be brought into the highest possible condition in an inconceivably short space of time. It is by such a system of management as this, that the monstrous swine are raised—their weight frequently exceeding 1,200 lbs., or, at all events, half a ton.—*Do not regret the loss or scarcity of potatoes*, so far as swine-feeding is concerned. The potato is capable of being replaced; and its loss has been the means of stimulating inquiry, and producing experiment, which has resulted in the discovery that many other useful vegetables have been hitherto neglected, and thoughtlessly passed aside.—*Do not neglect to keep swine clean, dry, and warm.* These are *essentials*, and not less imperative than feeding; for an inferior description of food will, by their aid, succeed far better than the highest feeding without them; and, while speaking of *cleanliness*, we may reiterate the benefit derivable from *washing* pigs; this will amply repay the trouble. They are always washed for agricultural shows, where they must be exhibited fat.—*Watch the markets. Sell* when a reasonable profit is to be got. Many a man has swamped himself by his cupidity, and by desiring to realise an unusual amount of gain. Recollect how very fluctuating are the markets, and that a certain gain is far better than the risk of loss. Even great capitalists have fallen from over-avidity.

Before leaving this subject, it may be beneficial, as well as interesting, to give a few instances of pigs which, by different kinds of feeding, have, in a given time, arrived at a proportionate increase of weight. Mr. Laurence

notices a few of these. He says that fifty large Norfolk swine, from 18 to 19 stone each, in thriving, healthy condition, were kept so on four-and-a-half bushels of peas per day, with wash; being about three quarts each per day. A Hampshire sow, weighing 11 stone, was stored upon two quarts and a-half of peas per day, with roots and wash. A Shropshire hog, three years old, was kept in high condition as a store—being nearly 80 stone, or 640 lbs. weight—on three bushels of barley-meal, with house-wash as usual, for every seventeen days: about eleven pints per day. The Earl of Winchelsea's celebrated prize hog, so much admired when exhibited, consumed, of corn and meal, one quarter, one bushel, and one peck, in fourteen weeks and three days. This animal was of the Suffolk breed, and consequently small. A Kentish hog, being six months old, and weighing 20 stone 1 lb., or 161 lbs., having been put up to fatten, consumed, during a period of forty-two weeks, forty-six bushels of peas and barley. It was then killed; and when stripped of its head, feet, flare, or internal fat, all loose fat, skirts, and kidneys, it was found to weigh 53 stone 3 lbs. A Tonquin pig—an epithet then given to the black and white, or improved Essex breed—weighed, at four months old, 104½ lbs. It was put up for forty-seven weeks; when, during that period, it consumed eleven bushels two pecks of hog peas, and eighteen sacks of meal, at 85 lbs. to the sack. When killed, its weight was 30 stone 2 lbs., at 8 lbs. to the stone; and it had, as usual, been dressed London fashion; that is, deprived of head, legs, flare, loose fat, &c.

Mr. French Burke gives the following details:—

"The time requisite for fattening, depends, of course, on the condition of the animal when put up, as well as upon its age. If a young store, five or six weeks may be sufficient; if older, six or eight; and if the mature age intended for a perfect bacon hog, of that moderate degree of size and fatness which is preferred for the general consumption of the middle classes, from twelve to fourteen. A bacon hog, if intended to be thoroughly fattened for farm use, should, however, be of a large breed, and brought to such a state as not to be able to rise without difficulty; but may, perhaps, require five or six months, or even more, to bring him to that condition. This, however, supposes him to be completely fat; to ascertain which with perfect accuracy, he ought to be weighed every week during the latter part of the process; for although his appetite will gradually fall off as he increases in fat, yet the flesh which he will acquire will also diminish, until, *at last, it will not pay for his food*, and he should then be immediately slaughtered. Thus the increase of flesh in a pig put up to be fattened, and regularly weighed, was, on the following dates:—

	stone.	lbs.	
"Oct. 10 . . .	36	7	
„ 24 . . .	41	5 . .	38 lbs. gain.
Nov. 7 . . .	45	7 . .	34 do.
„ 21 . . .	47	2 . .	11 do.
Dec. 5 . . .	48	7 . .	13 do.
„ 22 . . .	48	6 . .	1 lb. *loss.*

"Respecting the quality of food, vast numbers of bacon hogs are imported from Ireland, where they are almost invariably fed upon potatoes; but however apparently satisfactory may be their weight and condition, yet, when slaughtered immediately, or before having several weeks of substantial food, to harden their flesh, they are always found inferior to the corn-fed pork and bacon of this country, the fat having a tallowy appearance, of an insipid taste, and shrinking for want of firmness; whereas, when boiled, it should be transparently hard, with a tinge of pink in its colour; the flavour should be good, and the meat should swell in the pot. Potatoes, therefore, though fine food for stores, should never be used alone as sustenance in the fattening of bacon hogs; for, in proportion to the quantity employed, they will render the flesh, and consequently the price, inferior to that of hogs which have been properly fed. They are, however, frequently employed, when steamed, in conjunction with either tail or stained barley, coarsely ground; and farmers who grow potatoes for the market, may thus profitably dispose of the chats along with their unmarketable corn: but those persons who wish to acquire a reputation for producing fine bacon, should never use anything for fattening but hard meat, together with skim-milk, if it can be procured." The rapidity with which flesh can be laid on by pigs,

(says Mr. Richardson), when all the resources of human skill are brought to bear upon the point, is further illustrated by an experiment made by a very intelligent agriculturist, Mr. John Outhwaite, of Bainessee, related at the Thirsk meeting of the Yorkshire Agricultural Society. He laid a wager of £10, that one of his pigs would lay on 10 stones in a month, in place of one in a week, which is the usual average of a well-fed pig. He estimated the weight of the animal at 22 stones; and it increased nearly a stone over the gain of 10 stones in twenty-eight days. The eye can, perhaps, detect the increase in pigs' flesh more readily than either in cattle or in sheep—the touch being called to the aid in both these, to assist the eye, which is scarcely ever done in the fat pig of any age whatever.

CHAPTER V.

SLAUGHTERING; CURING BACON AND HAMS.

THE ordinary way of slaughtering a pig in the country, is to tie a rope round the upper jaw, and throw it across a joist or beam. This, by an assistant, is pulled just sufficiently tight to force the animal to support himself upon the extremities of his toes, whilst his snout is raised in the air. The butcher then kneels in front of him, and taking a knife, first shaves away the hair from a small portion of the front of the throat; then gently passing the blade through the superficial fat, he gives it a forward thrust, a turn, and then draws it out. This operation is followed by a gush of blood, which is caught in various vessels, for the purpose of being manufactured into black-puddings. The rope is next a little slackened, and life speedily becomes extinct. The next process is to put the pig into a scalding-tub, whence he is soon withdrawn, placed upon a table, and the hair and bristles carefully removed by scraping with a knife. He is next disembowelled. The more humane practice of stupefying the animal with a knock on the head before his throat is submitted to the knife, is often done; but we have heard it asserted, that a pig does not scald so well unless he has some remains of life in him. The ordinary way of ascertaining the death of the animal, is by passing a sharp knife between the claws, where the part is extremely sensitive; and the scalding process, if he quivers or exhibits some lingering signs of life, is not allowed to begin until this ceases. When this no longer appears, it is taken for granted that sensation has fled. An important element in the production of good bacon is, that the pig should be slaughtered as quickly, and with as little excitement, as possible. The animal, for at least a day, ought not to be allowed any kind of nutriment; and in killing the greatest care should be taken thoroughly to divide the jugular vein, so that he may bleed both rapidly and completely. After this comes the cutting-up.

"The hog," says Mr. Henderson, "should be left fasting for full twenty-four hours before being killed; and, after the carcass has hung all night, it should be laid upon its back upon a strong table. The head should then be cut off close to the ears, and the hinder feet so far below the houghs as not to disfigure the hams, and leave room sufficient to hang them up by; after which the carcass is divided into equal halves, up the middle of the back-bone, with a cleaving knife, and, if necessary, a hand-mallet. Then cut the ham from the side by the second joint of the back-bone, which will appear on dividing the carcass, and dress the ham by paring a little off the flank, or skinny part, so as to shape it with a half-round point, clearing off any top fat that may appear. The curer will next cut off the sharp edge along the back-bone with a knife and mallet, and

slice off the first rib next the shoulder, where he will find a bloody vein, which must be taken out; for if left in that part it is apt to spoil. The corners should be squared off when the ham is cut out."

For curing bacon, there is, literally, no end of recipes; and in Yorkshire, Westmoreland, and Cumberland, no sugar is made use of. Mr. Rowlandson's plan for salting is thus described:—"Having cut up a well-fed hog, which absorbs much less salt than an ill-fed animal, and runs very little risk of having been over-fed, salt and saltpetre, in the proportions of about one pound and a-half of salt, and one of saltpetre, to 41 lbs. of meat, must be sprinkled over the flitches, &c.; and then they must be laid, one over the other, in a slate trough, or a wooden trough lined with lead, to the number of half-a-dozen. In the course of twenty-four or forty-eight hours, according as the salt is converted into brine (and this will depend on the atmosphere; in frosty weather the meat will not take the salt, and in moist weather it is apt to spoil), the sides are removed, rubbed, replaced in inverse order, the top at the bottom, with a little fresh salt sprinkled between each course, and the brine thrown over the whole. In favourable weather for curing, once turning and replacing will be found enough, and will not occupy more than a week. Packed dry with layers of salt, and covered with canvas, bacon is thus prepared 'green' for the London markets, and thence drawn to be smoked as required for consumption." To this Mr. Rowlandson adds, "that nothing makes better hams or bacon than a well-bred sow, spayed after producing four or five litters."

The most approved method of curing bacon, as practised by a majority of extensive curers, is thus given by Mr. Richardson:—"If the swine you design killing have been a recent purchase, and have been driven from a distance, so as to have become winded or jaded, it is right that they should be kept up for a week, or perhaps more, until the effects of the journey have been entirely removed, and the animals restored to their original tranquillity and primeness of condition. During this interval they should be fed upon meal and water. A difference of opinion exists, as to whether this food should be given in a raw state or boiled. I have taken some pains to ascertain the truth, and have no hesitation in pronouncing in favour of the latter. At the same time, however, the mess should be given in a perfectly cold state, and not of too thick consistence. Some recommend that a small dose of nitre should be given daily in the food for a fortnight previous to killing. Others pronounce this to be unnecessary; but all unite in recommending a very considerable reduction in the animal's food for two days before killing, and a total deprivation of food for at least the last twenty hours of life."

For domestic purposes, bacon is cured by well rubbing into the flitches a sufficient quantity of salt with a little nitre, either with the salting-glove or the bare hand. The flitches are then placed on the floor of an outhouse, and covered with straw, with the rind downwards—straw being laid above this; then another flitch, and so on. Over the whole is placed a board; and, above all, heavy stones or weights. In three weeks, or a month, the meat is sufficiently salted, and is hung upon hooks in the kitchen rafters. The general practice of burning wood and turf, in some kitchens, imparts a sweetness to the bacon not to be met with in *any* which can be purchased. Another mode is to prepare a pickle, by boiling common salt and nitre in water. Mix, for a single pig of tolerable size, 1 lb. of coarse brown sugar with half a pound of nitre: rub this well in with the salting-glove; then put the meat into the pickle, and let it lie there for two days; afterwards take it out, and rub it with salt alone; then put it back into the pickle. A sweet pickle may be formed by boiling molasses with salt and water. In using this, rub the meat with sugar and nitre; add a small portion of strong pickle to the meat; put the meat into this, and let it lie in it for three weeks. If there be any spare room in the cask, fill it up with molasses. Eight pounds of salt, one pound of nitre, and six pints of molasses, will about suffice for each hundredweight of meat, and will take about five gallons of water. In about three weeks—less or more time being required, according to size—take the meat out of pickle, and hang it in the drying-house. While kept there, the flitches should be hung neck downwards. The ham and the flitch may be cut out and trimmed, according to fancy.

"Nearly every county has, in this respect, a fashion of its own. If you possess the means, remove your hams and bacon to the smoking-house. They should not be suffered to *touch each other*. With this precaution you may hang them as closely as you please. Smoke-houses are of every dimension; but the smallest answer as well as the most extensive. Before suspending the meat in the smoke-house, it should be previously well rubbed over with bran. The fire is made of sawdust, which burns with a low smouldering glow, giving out far more smoke than if actually flaming. In the process of smoking, your meat will lose from about 15 to 20 lbs. per hundredweight—a fact necessary to be borne in mind."

Sometimes the pigs are killed before they arrive at full size, and their hair removed by singeing; the bacon and hams of these are said to possess peculiar delicacy of flavour. The best sawdust for smoking hams or bacon, is that made from oak, and it should be thoroughly dry. The sawdust of common deal imparts a flavour of a disagreeable character, not unlike that of red herrings.

WESTPHALIAN HAMS.

The *genuine* Westphalian bacon is particularly good, and the fine quality depends on several causes; as the healthy and semi-wild life the swine are permitted to enjoy; their relationship to the wild boar; and their not being fattened to the fullest extent previous to killing. A large portion of *sugar* and *juniper-berries* is used in curing, the proportion being usually 1½ lb. of sugar to 3 lbs. of salt, and 2 ozs. of nitre. The *smoke* is also applied in a *cold state*. This is, perhaps, the principal secret. The hams are hung at the top of a very lofty building, and by the time the smoke reaches them it is perfectly *cold*. These hams are the most famous in Europe, and are principally cured at, and exported from, Hamburg. The smoking process which they undergo, is performed in extensive chambers in the upper storeys of high buildings. Some are four or five storeys high; and the smoke is conveyed to these rooms from fires in the cellar, through tubes, on which the vapour is condensed, and the heat absorbed; so that the smoke is both dry and cool when it comes in contact with the meat. They are thus kept perfectly dry, and acquire a colour and flavour unknown to those smoked by the common method. Hams, after being smoked, may be kept for any length of time, by being packed in dry ashes or powdered charcoal, or by being left in the smoke-house, if that is secure against theft; or a smoke being made under them once a week. When meat is fully smoked or dried, it may be kept hung up in any dry room, by slipping over it a cotton bag, the neck of which is closely tied around the string that supports the meat, and thus preserving the bacon from bug, fly, &c. The small part of a ham or shoulder should always be hung downward in the process of smoking, or when suspended for preservation.

YORKSHIRE BACON.

The mode of curing, in Yorkshire, consists of hanging the pig for twenty-four hours, until it has become perfectly stiff. It is then cut up in the common way. The large veins which proceed from the jugular are carefully extracted with a fork. The bacon is then removed to leaden bowls—the salt wiped over the smooth side, and the shanks carefully stopped with salt and saltpetre, from four to six inches deep. The skin side is then laid downwards, and the whole flesh side covered with salt, and sprinkled with saltpetre. The same is done to the hams and the other sides; and the proportion of coarse salt—which is always used for the purpose, in preference to the more finely pounded—allowed for a 20 stone pig, is 1 stone of salt, and 1 lb. of saltpetre; and so on in proportion. Two or three pigs may be laid in a leaden bowl, exposed to a northern aspect, with plenty of air, and in a place especially free from all putrefying matter. In three days all the sides are removed, the bottom ones placed uppermost, and the whole of the bare places, in the flesh side, again covered with salt. In this way the bacon is removed three or four times in a month, during which period it is said to be in pickle. It is then taken out of the leaden bowls, set on an edge, and the extraneous salt wiped off. It is hung for three weeks more in the kitchen, and is then fit for storing away. This is generally done in sacks, strewed with bran, where it remains until taken out for use, when it is much esteemed.

HAMPSHIRE BACON.

This bacon is held in very high estimation. With both Hampshire and Berkshire bacon, the proper time is to choose a dry day, when the wind is blowing from the north; and kill the hog early in the morning, if having fasted the day before. "When dressed," says Mr. Youatt, "hang him up in some airy place for twenty-four hours; then proceed to cut him up. This being done, lay the flitches on the ground, and sprinkle them with salt lightly; so let them remain for six or eight hours; then turn them up edgeways, and let the brine run off. In the meantime, take two or three gallons of the best salt, and two ounces of saltpetre, pounded very fine, and well mixed together; and the salting-bench being made of the best seasoned oak, proceed to salt the flitches by rubbing in the salt on the back side of the flitch. This being done, turn the inside upwards, and lay on the salt about a quarter of an inch in thickness. In like manner treat every flitch. On the third day afterwards change the flitches—namely, take off the uppermost, and reverse them at the same time, laying the salt a quarter of an inch in thickness. There will be no need of rubbing as before mentioned, neither should the saltpetre be repeated, otherwise the lean of the bacon will be hard. The changing and salting should be done every third day for six successive times, when the bacon will be sufficiently salt. Then proceed to rub off all the stale briny salt, and lay on each flitch a covering of clean fresh bran or sawdust, and take it to the drying-loft. It should be there hung, by means of crooks fastened in the neck of the flitch, and remain for fourteen or sixteen days. Cleft oak or ash is the best wood for drying bacon." In both this county and in Berkshire, *singeing* is adopted more generally than scalding; and this process is considered superior to scalding, the latter being supposed to soften the rind and render the fat less firm. The Wiltshire bacon is of a peculiarly delicious quality; but the cause is obvious, and is not to be referred to any of the details of the curing process. It is prepared from *dairy-fed* pork. This is the true secret. The same remark applies to the Cumberland bacon. In several counties the hog is *skinned* prior to curing. Some amount of additional profit is, of course, derivable from this practice; but the bacon is inferior, being liable to become rusty, as well as to waste in the boiling. Hams and flitches should always be hung up in a *dry* place. Indeed, it will be found useful to sew up the former in pieces of canvas or sacking, as is the practice with the Westphalian.

THE SCOTCH MODE OF CURING HAMS AND BACON.

In Mr. Henderson's treatise on swine, we find the following account of the method of curing hams and bacon in Scotland:—"In killing a number of swine, what sides you may have dressed the first day, lay upon some flags or boards, piling them across each other, and giving each flitch a powdering of saltpetre, and then covering it with salt. Proceed in the same manner with the hams themselves, and do not omit giving them a little saltpetre, as it opens the pores of the flesh to receive salt, and gives the ham, besides, a pleasant flavour, and makes it more juicy. Let them lie in this state about a week; then turn those on the top undermost, giving them a fresh salting. After lying two or three weeks longer, they may be hung up to dry in some chimney or smoke-house; or, if the curer chooses, he may turn them over again, without giving them any more salt; in which state they may lie for a month or two, without taking any harm, until he has convenience for drying them. I practised, for many years, the custom of carting my flitches and hams through the country to farm-houses, and used to hang them in their chimneys, and other parts of the house to dry—some seasons to the amount of 500 carcasses. This plan, however, was found to be attended with a number of inconveniences. About twenty years ago I contrived a small smoke-house of very simple construction. It is about twelve feet square, and the walls about seven feet high. One of these huts requires six joists across—one close to each wall, the other four placed at proper distances. To receive five rows of flitches, they must be laid on the top of the wall. A piece of wood, strong enough to bear the weight of one flitch of bacon, must be fixed across the belly end of the flitch by two strings, as the neck end must be hung downwards. The pieces of

wood must be longer than the flitch is wide, so that their ends may rest upon a beam. They may be put so near to each other as not to touch. The width of each will hold twenty-four flitches in a row, and there will be five rows, which will contain 120 flitches. As many hams may be hung at the same time above the flitches, arranged in the best manner you can. The lower end of the flitches will be within two-and-a-half or three feet of the floor, which must be covered five or six inches thick with sawdust; this should be kindled at two different sides. It will burn, but not cause any flame to injure the bacon. The door must be kept close, and the hut must have a small hole in the roof, so that part of the smoke may ascend. This lot of bacon and hams will be ready to be packed up in a hogshead, and sent off in eight or ten days, or a little longer, if required, with very little loss of weight. After the bacon is salted, it may lie in the salt-house until an order is received."

THE IRISH MODE OF CURING HAMS AND BACON.

In Limerick, hams have long had celebrity; and their excellence is supposed to arise principally from the sparing use of salt, and the substitution for it, to a large extent, of coarse sugar, accompanied with a judicious plan of smoking. Some of the rooms in which this process is carried on, have a height of upwards of thirty feet. To extract the superabundant salt from the meat, Mr. Richardson recommends the following:—"Put your meat to steep in tepid water; and after it has lain in it for some hours, add a small quantity of sulphuric acid. In three or four hours take it out, and wash it two or three times in water; to the third water add a small portion of carbonate of soda. Take your meat out, wash it again, and boil it for dinner. You will find the salt nearly, if not wholly discharged; but you need not be surprised, should the *colour* of the meat be somewhat darkened; the deterioration does not extend further; the flavour remains the same as when first corned, and the article becomes as wholesome as fresh meat. It is possible that this simple process may be found useful in long voyages; for a long-continued diet of salted animal food, without a free use of vegetables, is found to contribute to the production of many diseases. A much more simple process is the steeping of the bacon over-night in cold water. So great is the affinity of salt for water, that a twenty-four, or even eighteen hours' steep, will generally remove any degree of superabundance of salt. It interferes less with the flavour than any other chemical mixture whatever; and is, on this account, and its easy mode of being effected, by far the preferable plan."

The following communication was sent by Mr. J. Hawkins, Dublin, to Mr. Richardson, and explains the Irish mode of curing hams and bacon:—

"The hog is usually kept fasting for twenty-four hours previous to being killed. He is then brought to the slaughter-house, and dispatched in the following manner:—The butcher takes a maul (a hammer with a long handle, like those used for breaking stones on a road), and with it strikes the pig on the forehead. If he be an expert hand, a single blow will suffice to knock the hog down, and render him quite senseless. A knife is then taken, and the butcher sticks the animal in the lower part of the throat, just between the fore legs. A boiler, or tub, full of very hot, or boiling water, is in readiness, in which the hog is immersed until the hair becomes so loose that it can be scraped off with a knife quite clean. When there is no convenience of this kind, the same effect may be produced by pouring boiling water over the pig. The hog is then hung up by the hind legs, cut up the middle, and the entrails taken out; after this, the carcass is left there for about twelve hours, to cool and become firm, when it is fit for boning or cutting up. Sometimes, instead of scalding, the pig is swaled by fire: burnt straw is generally used for this purpose; and this is called 'singed pork.'

"The following is the mode of boning or cutting:—The pig is placed on a strong table or bench; the head is then cut off close to the ears, and the body opened down the back. A cleaver or saw is used for the purpose, and both back-bone and hip-bones are taken out, except in one or two places, yet to be spoken of, where a different system is pursued. The hind feet are then cut off, so as to leave a shank to the ham. The fore legs are next cut

round at the hough, the flesh scraped upwards off the bone, and off the shoulder-blade, which is taken out quite bare under the side. The saw is then run along the ribs, so as to crack them, when they will lie quite flat. The pig is then divided straight up the back, and the sides are ready for salting; the ham still remaining in. This is the method usually practised in the county of Wicklow. When the sides are ready for salting, they are well rubbed on the rind side, and the space from which the shoulder-blade was taken out is filled with salt. The sides are then laid singly upon a flagged floor, and salt is shaken over them. In a day, or two days, if the weather is cold, they must be again salted in the same manner; but now two sides may be put together, and powdered saltpetre shaken over them, in the proportion of about two ounces to each side, if of average bacon size. After three or four days, the sides are to be again changed, the shanks of the ham rubbed, the salt stirred, a little fresh salt shaken over them, and five or six sides may now be placed over each other. The sides may then be left thus for a week, when they may be piled one above the other, to the number of ten or twenty, if there have been so many pigs killed. Leave them so for above three weeks, until they get firm. They may then be considered cured, and will keep so for six or eight months, or according to pleasure. When required for use, or for market, the sides are taken out of the salt, and well swept and cleaned; the ham taken out, hung up, and dried with turf. If a brown colour is desired, a little sawdust of hard wood may be thrown over the turf. If hung up in a kitchen where turf is burned, and suffered to remain, not too near the fire, the same effect will be produced; and if the bacon has been well cured in salt, it will be excellent. The Belfast and Limerick methods of cutting differ from what I have described, inasmuch as the hip-bones are left in, and the hams are cut out while the pig is fresh, and cured separately. In some cases, also, the ribs are taken out of the sides; and, in Belfast, the shoulder-blade is taken *out over the side.* Both the Belfast and Limerick hams are cured in the same mild manner; they are, as I have stated, cut out of the pig when fresh, cured separately, and only left a sufficient time to be cured, and no more. They are not suffered to become too *salty*—a fault sometimes perceptible in the Wicklow hams. The Limerick and Belfast curers also make up different other portions of the pig separately, as *long sides*, *middles*, and *rolls*, for the English market. Sometimes the ribs are taken out, and sometimes not, according to the market for which they are intended. Limerick, Belfast, Wicklow, and Waterford, are the principal curing districts of Ireland. The Wicklow method, first described, is that in use in all counties of Ireland which prepare their bacon for the Dublin markets. The bacon, when cured, is then consigned to factors in Spitalfields, and sold on commission to the provision-dealers of Dublin. Limerick and Belfast hams are cured in the following manner. They are, as I have said, cut fresh from the pig, with the hip-bones left in them, and are placed on a flagged floor, the front of the second ham resting upon the shank of the first, and so on until all are placed; they are then sprinkled with strong pickle from a watering-pot, and a small quantity of salt is shaken over them. Next day the hams are taken up, well rubbed with salt, and laid down as before, when saltpetre is shaken over them in quantities proportionate to their size; they are left so for two days, and then taken up and rubbed as before, when they are laid down again, according to the space they have to fill —from three to six hams in height, with layers of salt between. After six days, the hams are reversed in the piles; that is, those that were packed on the top are put at the bottom. They then remain for six days longer in the pile, when they are considered cured. After this, they are taken up and washed, and hung up to dry in the air. When it is intended to smoke them, they are placed in a house made for that purpose, and smoked—in Belfast, with wheaten straw and sawdust; in Limerick, with peat or turf."

Curing bacon for the navy is differently performed from ordinary salting. A little more skill is exercised in cutting up the pig into pieces of as nearly equal size as possible; when a combination of salt and saltpetre dissolved in water, and almost in a saturated solution, is placed in the curing-tub, and there allowed to remain from three to four weeks.

A barrel is provided, and the bottom covered with a layer of hay and salt; then alternate layers of pork and salt up to the top, when it is covered and coopered up, so as to exclude the air as completely as possible. A hole is then made in the head of the cask, and the saturated pickle is poured in till the cask is full, when it is plugged up, and ready for use. Salt pork, as it is called, is generally a much more useful and genuine article than either of the preserved meats, or the salted beef supplied to the navy.

The principal injuries to which bacon, after curing, is liable, is that of becoming *resty*, and being infested with the larvæ of a small fly known as *jumpers*. The first often takes place if it is dried too near the fire, or is exposed unnecessarily to the air. In drying, it should be so near the fire as to be within its influence—so far from it as to prevent its frying, and so turning rancid, known provincially as "rusty" or "reasty" bacon. Some parties recommend whitewashing the bacon with lime-wash after it is dried; and this is certainly a decided preventive; but it may be equally prevented by being cured with plain bran, or any wholesome material which will keep it from the air.

CHAPTER VI.

DISEASES OF THE PIG.

It is observed by Mr. Youatt, that swine, from having been, until recently, considered as a subordinate species of stock, have not yet, to any extent, become sharers in the benefits which the present advancing state of veterinary science has conferred upon other domesticated animals. "When anything goes amiss in the piggery, the farmer, too often, instead of exercising that shrewd sense which he turns to so good an account in almost every other instance, either sends for the butcher, or consigns the sick tenants of the sty to the care of an ignorant pig-doctor, whose whole pretensions to leech-craft rest on the possession of some antiquated recipe, which he uses, indiscriminately, as a grand panacea for 'all the ills that swine's flesh is heir to,' or on the traditionary lore he inherits from some ancestor, famous in his day for certain real or supposed wondrous cures." That this is still, in a great measure, the case in many parts of the country, cannot be doubted; but if proper care were taken of the pig, disease would much more rarely attack him, and his owner would reap far more advantage from it than he otherwise does.

"Cleanliness," says Mr. Richardson, "is the great point to be insisted upon in swine management. If this, and warmth, be duly attended to, the animal will not, in one case in a hundred, become affected with any ailment. The pig-feeder will find that, in most cases, his pigs will never ail from their birth to their slaughter. There may be a few attacked with disease; but the feeder will generally find that the first symptoms of it will give way before a dose of flour of sulphur—say half an ounce for a large animal, combined with new milk, which he will generally drink—with warmth and confinement. As it is almost impossible to administer medicine by force, it is better thus to take the disease in its first stage, and give it to them by enticement."

The following are a selection of some of the principle diseases to which the pig is liable; and the treatment recommended in them is such as has been found effectual.

APOPLEXY.

This disease is chiefly brought on by high-feeding, want of exercise, and laziness, all of which beget a plethoric habit, inducing apoplexy, which in swine is often fatal. When it

appears, the treatment must be very prompt, and blood should be immediately taken from the palate. As purgatives, Epsom salts and sulphur should be given, or emetic tartar, dissolved in sufficient water to cause the animal to vomit. Should these prove effectual, there must be no stimulating food given for some time afterwards, and the animal should be bled, at least, every three months. There should also be some nitre infused with the water he drinks.

CATARRH, OR COLD.

This disease springs from the same causes as those which affect other animals with it. It consists of an inflammation of the mucous membrane of the nose, &c.; and, if taken in time, is easily cured by opening medicine, succeeded by a warm bran mash, abstinence from rich grains, and careful, comfortable housing. Where the cases are very severe, it is well to administer medicine; and the following is recommended by a writer in Morton's *Cyclopædia*:—

Antimonial powder . . .	2 to 6 grains.
Nitre	10 „ 30 „
Digitalis	1 „ 2 „

This to be given daily. Should the disease extend to the lungs and become bronchitis, in addition to the above medicine, the animal should be bled, and a stimulant rubbed on the brisket.

COLIC.

Colic frequently attacks the hog, and is indicated by the animal rolling on the ground, murmuring sounds that betray suffering, and exhibiting great restlessness. The following is recommended to be administered:—

Peppermint water . . .	1 gill.
Tincture of opium . . .	40 drops.

The animal must be kept warm, and supplied with new and warm milk, until well. Some recommend a dose of Epsom or Glauber salts; but for colic, oleaginous medicines are the best; therefore, castor-oil, given in a dose proportioned to the size of the pig, may be safely administered.

CASTRATION.

As this can be no more called a disease than parturition or spaying, it might have been introduced in another part of the Division of this work; still, as it is a surgical operation, we consider this the most appropriate place to speak of it. There is no great difficulty in the performance of this operation, consequently, in country towns, there is always one sufficiently skilled in the art to gain a livelihood by it. In castrating hogs, which should not be older than three weeks, they are grasped by an assistant by the hind legs, with their faces towards his person, so that the testes may be kept on a level with the hands of the operators. As the skin of the testes is loose, a longitudinal cut is made in the scrotum, over each of them, when the finger and thumb are pressed gently on each side of the incision, so as to cause the testes to protrude. This being done, it is gently taken hold of by the other hand, and the spermatic cord separated by the knife. The whole of the operation is soon over; but, after it, the pig should be suffered to fast for a few hours, although the little animals seem to be so slightly affected by any pain which they may have endured, that, by the following morning, they are as active as ever. Beyond three weeks, and in proportion to the age of the animal, the operation becomes proportionally difficult. "With the aged boar, especially, it is a very tedious affair, as he cannot be held up in the way the young pigs can under a month old. It is thus necessary to lay him on his side, and have him well secured before the operation is performed. He should also fast a little before it is done, as well as through the following night, and be supplied only with bran and milk after. Sows in season should be kept from him till the wound is healed. There is more difficulty, however, in performing the operation, either on the old or young, when there is a rupture, which is not unfrequently the case. Greater care must be taken in making a perfectly clean cut. The pigs should fast a day before, and a night, at least, after the operation; and the scrotum should be carefully stitched up after its performance, otherwise inflammation will ensue."

CRACKINGS.

The cause of crackings is exposure to the extremes of temperature; and when they do

appear on a pig, it is usually upon the flanks, and at the roots of the ears and tail. In the heat of summer the disease is especially troublesome, should the hog be exposed, for any length of time, to the direct influence of a hot sun, and no pool or marsh near in which he might recruit himself, and cool his body with a bath. To cure the disease, after neglect has brought it on, the affected parts should be anointed two or three times a day with tar and lard, well melted together.

DIARRHŒA.

Among all our domesticated animals this disease is very common, and is produced by scanty and unwholesome food, as well as by over-feeding. It arises from inflammation or congestion of the mucous lining of the intestines, and consists of a thin discharge of the fœcal matter. Before trying to stop this discharge, a change of diet, from that which the animal has been feeding on, will often be effectual in producing a cure. If, however, it continue for any considerable length of time, medicinal remedies should be resorted to. The best for it is—

Prepared chalk	1 oz.
Powdered catechu . . .	½ „
„ ginger . . .	2 drachms.
„ opium . . .	½ „

These should be mixed and dissolved in half a pint of water, and from half an ounce to an ounce of the mixture, according to the size of the animal, given twice a day. The diet should, as far as possible, be composed of dry farinaceous food.

EPILEPSY.

This disease is common, and often arises from the ringing of the mother during the period of gestation. The indications are restlessness, constant grunting, and a greater quickness in the breath, accompanied with an unsteady, staggering gait. Bleeding, strong purgatives, and cold effusions applied to the head, followed by low diet and cooling medicines, are the remedies.

FEVER.

The symptoms of this disease are, redness of the eyes, dryness and heat of the nostrils, the lips, and the skin generally. The appetite is entirely gone, or very indifferent; whilst the thirst is usually violent. The animal should, as soon as possible, be bled at the back of the ears; and if this is not sufficient, a portion of the tail should be excised. Good and comfortable housing must be attended to; whilst, at the same time, there must be a free admission of fresh air. The bleeding will, perhaps, in an hour or two be followed by such a return of appetite as to induce the animal to eat sufficiently to enable it to support the administration of some internal remedies. For giving it these, the best vehicle is bread, steeped in broth. The fever, however, will usually be found to yield to the bleeding; and the only object to be kept in view is, to endeavour to support the strength of the animal by small portions of nourishing food frequently administered. It must, however, be borne in mind, that, as the hog surpasses every other animal in the rapidity with which it accumulates fat, so does it in the facility with which its strength becomes prostrated when once it loses its appetite. The French veterinarian practice recommends the addition of peppermint to the bread and broth; and if the bowels are confined, the addition of castor and (unboiled) linseed oil, in equal quantities, and in the proportion of two to six ounces, according to the size of the pig, should not be omitted. Mr. Moubray relates the following instructive case, which may serve as an example to be taken in others:—"One of my sows, four years old, a good mother, remarkably good-tempered, a cross between the Oxford and China breeds, with eleven fine pigs by her side, which had been farrowed three weeks, was suddenly seized with fever and inflammation. In twelve hours she became unable to stand; was very restless, and apparently in great agony; no evacuation having taken place during two days. In consequence, I called in the aid of a noted cow-leech in the vicinity, who gravely promised he would do what he could for her, but that all would be of no use. The operations of bleeding, anointing, and medicine, were carried on for three days, at a charge of thirty-five shillings, when the sage doctor dismissed the case, with the consolation to me that he could do no more for the patient, and that it was impossible that she could live. I then took her in

hand myself, bled her, and gave her a strong dose of salts and jalap, which I succeeded in delivering, her jaws being held open by a rope attached to each. In about an hour thereafter she had three pints of warm gruel; and in less than three hours I had the satisfaction of observing symptoms of great tranquillity and improvement in my patient. After leaving her at night on a clean and comfortable bed, I was gratified by finding her on her legs the next morning, and in a fair way of recovering. I then repeated the above dose, somewhat reduced in strength, and still keeping her on warm gruel, when, in two days, my satisfaction was complete, on finding her quite restored to her former health, saving a little inconvenience from the obstruction of her milk. Of the young pigs, previously removed, nine did well; and the sow became freed from all relics of her disease in ten or twelve days. I did not, however, choose to risk another farrow with her, therefore put her to the boar in October, and fed her for the knife. She was killed at Christmas, and made excellent bacon. Thus, I saved a fine hog by Dr. Common Sense, to atone for the insufficiency of the most skilful *leech* then and there going; and if my brethren pig-breeders would follow my example, in most cases, in my opinion, it would be to the benefit both of their pockets and their pigs."

There is a description of fever that frequently occurs as an epizootic, which is described by M. Rooche Lubin, in *The Veterinarian*, and from which we make some detached extracts bearing upon this subject.

"*The Charbonneuse typhus* of pigs does not always assume the same character. It often attacks the male pigs, and generally the most vigorous and the best looking, without any distinction of age, and with a force and promptitude absolutely astonishing; for in the space of twelve hours I have seen a whole piggery succumb. At other times its progress is much slower; the symptoms are less intense and less alarming; and the veterinary surgeon, employed at the commencement of the attack, may promise himself some success. It will be advisable to divide the whole into different classes.

"First Class.—*Symptoms.*—The pigs that are ranged in this class often die without there being the slightest precursory symptoms. I have been able to collect only the following:—Sudden loss of appetite, and a general prostration of strength; small and frequent pulse; the ears drooping, of a dark colour, and tender to the touch; the eyes projecting and haggard; the conjunctiva of a deep red; the mouth half open, red, and charged with foam; a leaden tint stealing over the part; frequent and laborious perspiration; anxiety; plaintive cries; frequent convulsions; the appearance of red spots, and becoming more and more deep at the ears, the belly, and the inner surface of the thighs; palsy of the hind limbs; involuntary and fetid discharge. In less than an hour this animal died.

"Second Class.—*Symptoms.*—In this class I range the pigs in which charbonneuse typhus follows a somewhat rapid march, and offers some sufficiently distinct periods. The symptoms that are the least alarming, and the malady the least rebellious, are the following:—The animal is dispirited, continually lying down, and not getting up without evident pain; the ear is hot and painful; the pulse quick, but regular; the conjunctiva red; the eye fixed; the respiration a little agitated; the flank distended and painful; the tail hanging down; the animal drinking with difficulty, and eating, without appetite, even the most delicious food; he is likewise constipated. This state sometimes remains two days without any sensible change; but, on the third or fourth day, if the medicine that we have employed is without effect, the symptoms redouble their intensity. The pig grinds his teeth, trembles, and is convulsed in every part; the pulse becomes intermittent, and, by degrees, is almost perfectly lost; the pupil is dilated; the red spots become more and more deep in colour, and death is near at hand. The pathological lesions are nearly the same as those already described, except those of the tissues. I have sometimes found the nasal and buccal membranes quite decomposed, and the interior of the mouth presenting numerous black and charbonneuse spots. One mark should be regarded. The sows with young ones always resist the attack of the disease; but, as soon as the little ones are produced, the malady does not spare either the one or the other. *The causes of the disease* are, in the majority of cases the *bad sties*

in which the pigs are lodged, and the noisome victuals which they often contain. The food which the pigs meet with and devour, is the remains of mouldy bread and fruit, more especially peas and lentils—the fermentation and decomposition of which farinacious substances, with the quantity of bran which is too frequently given to them, occasion the most serious ills in the animal economy. In addition to this, is the constant lying on the dung-heap, whence is exhaled a vast volume of deleterious gas; and also, when they remain too long on muddy or arid ground, or are exposed to the rigour of the season for any length of time. Such are the causes which effect a functional derangement that cannot fail of being dangerous or fatal, especially when brought back to the farm. The pigs are then exposed to an alarming degree of humidity; they lay themselves down on a poisonous and disgusting dung-heap, which is certainly destructive. I could also cite many villages and farms which, for two months of the year, have the houses of their pigs destitute of almost everything that is comfortable and useful. Although, during the whole course of the year, this typhoid disease never suspends its ravages, yet there are certain times in which it rages with great intensity—in the course of the summer, and the commencement of autumn. There are farms and communes where it is enzootic. It is a highly contagious disease. I could cite many facts confirmatory of this; and need only speak of the inoculation in different parts of the body, and the ichorous matter which is contained in the spots that affect every part. The consequence to the pigs at first brought home, apparently sound, is, that when a little time has passed away, the disease spreads through the whole of the piggery. As to the transmission of the malady, by ordinary means, to different kinds of animals, I am unable to give any opinion. The flesh of infected pork has been given to dogs. No evil has resulted from this experiment; and the inoculation of blood and of ichorous matter has not occasioned any morbid affection to the last of these animals; but it was not the same with regard to some sheep that were submitted to a similar experiment. They died two days after the operation, presenting all the symptoms and pathological lesions of charbonneuse fever.

"*Preservative Treatment.*—The experience of every day proves that it is more easy to prevent a malady than to cure or combat it. In consequence, I have always said to the farmers who suffer the accumulation of typhoid maladies, that they will never banish these from their piggeries whilst the system of carelessness and ignorance, touching the rearing of the pig, continues to be so negligently overlooked. I have always said to them, that, in despite of their singular remedies, the scourge under which they labour will not disappear until they place the animals in proper situations—not humid, but well aired, and where the litter is often renewed; until, also, they give them sound nourishment, properly regulated, and of sufficient quantity; a pure and limpid water to quench their thirst; and bathe them, whenever the temperature is much increased, while they are weltering in the mire. It is also requisite that the pigs should remain in their sties in cold and rainy weather. In the course of the summer, it is always necessary to give, from time to time, some nitrated, salted, and acidulated food. The Rochefort cheese is a useful stimulant for those that are weak and feeble; and the administration of any bitter decoction will often be productive of benefit. During the principal ravages of the epizootic, I have seen benefit derived from small quantities of camphor and nitre, mixed with a decoction of sorrel. To this some have added, and with considerable benefit, a small quantity of mercury. The nasal membrane then secretes more abundantly, the urine is clear and more frequent, and the evacuation of the fœcal matter is more easy and copious. This mode of treatment may be continued eight days. If a pig is evidently ill, it should be separated from its companions; and even their abode should be changed, and fumigation should be practised every third day. As soon as a pig is attacked with disease, he should be separated from the others, placed in a warm situation, some stimulating ointment applied to the chest, and a decoction of sorrel administered. Frictions of vinegar should be applied to the dorsal and lumbar region, with aromatic fumigation about the belly. The drinks should be emollient, and slightly mixed with nitre and vinegar. If the fever now appears to be losing ground, which may be ascertained by the

regularity of the pulse, by the absence of the plaintive cries that were before heard, by a respiration less laborious, by the absence of convulsions, and by the non-appearance of blotches on the skin, there is a fair chance of recovery. We may then be content to administer, every second hour, the drinks and the lavements already prescribed, and to give the patient his proper allowance of white water, with ground barley and rye. When, however, instead of these fortunate results, the symptoms are redoubling in intensity, it will be better to destroy the animal; for it is rare that, after a certain period, there is much or any chance of recovery. Bleeding, practised at the ear or tail, is seldom of much avail, but occasionally produces considerable loss of vital power and augments the putrid diathesis."

FOUL SKIN.

Washing the animal with a solution of chloride of lime, and keeping it clean, will generally cure this disease, provided it has not been suffered to go so far as to have assumed a malignant character.

HEAVINGS.

This disease takes its name from the principal symptom by which it is characterised, and is scarcely to be regarded as curable. "In its first stage," says Mr. Richardson, "when indicated by loss of appetite, and a short hard cough, it might run some chance of being got under by copious bleeding, and friction with stimulating ointment on the region of the lungs. Minute and frequent doses of tartar emetic should also be given in butter; all food of a stimulating nature carefully avoided, and the animal kept dry and warm. Under these circumstances there would be no reason absolutely to despair of a cure; but it would be advisable at the same time, if the pig, when this primary stage of the malady is discovered, were not in very poor condition, to put him to death." The cause of the disease is damp lodging, foul air, want of ventilation, and unwholesome food.

INFLAMMATION OF THE LUNGS.

This disease is frequent among pigs. Professor Dick says, that the only hope of saving the patient, is by attacking the complaint in its early stages. Bleeding should be immediately resorted to. A dose of the following ingredients may be tried to stave off consumptive tendencies:—

Spirit of sweet nitre . . .	¼ oz.
Digitalis tincture . . .	20 drops.
Emetic tartar	1 drachm.
Hydrocyanic acid . . .	10 drops.

If, after the first stage, incipient inflammatory action passes over, warmth and milk diet will be necessary; and the sooner the animal is fed the better. Mr. Youatt says, as soon as the first symptoms are perceived, the animal should be bled; the palate will, perhaps, be the best place to take blood from; purgatives must then be given, but with caution. Epsom salts and sulphur will be the best, administered in a dose of from two to four drachms of each, according to the size of the animal. To these may succeed sedative medicines, composed of the following ingredients:—

Digitalis	2 grains.
Pulv. antimonialis . . .	6 ,,
Nitre	½ drachm.

This forms a very soothing and efficient medicament for moderate-sized pigs, and will often produce very satisfactory results. Cleanliness, warmth, and wholesome, cooling, nutritious food, are likewise valuable aids in combating this disease.

JAUNDICE.

The symptoms of this disease exhibit themselves in a yellowness of the white of the eyes, and also of the lips, and sometimes in a swelling of the under portion of the jaw. In treating for it, the food given to the animal should be restricted, and an aperient given to it every day. Aloes, combined with colocinth, in proportion to the size of the animal, may be administered. French veterinarians have recommended a decoction of woodbine-leaves, with shoots; but we are not prepared to speak of the effects of this preparation.

LEPROSY.

The symptoms of this complaint usually show themselves in a small humour in the eye, the head drooping, the breathing short and hot, accompanied with giddiness, and a discharge of matter from the eyes. When the

disease is pretty far advanced, the skin becomes quite scaly. The flesh of a leprous pig is said to possess extremely deleterious qualities, and to be wholly unfit for human food. In the first stage of the disease, a little blood should be taken from the animal by cutting the ear and tail; then boil a handful of nettles in a gallon of small beer, and add half a pound of flour of sulphur, a quarter of a pound of pulverised aniseeds, three ounces of liquorice, and a quarter of a pound of elecampane. This liquid should be given in milk in six doses, and the diseased animal kept on wholesome food. To remove the scurf, the pig should be washed with soap and warm water. Mr. Richardson recommends the following mode of treatment:—"The cause of this disease is want of cleanliness, absence of fresh air, want of due attention to ventilation, and foul feeding. The obvious cure, therefore, is—first, bleed; clean out the sty daily; wash the affected animal thoroughly with soap and water, to which soda or potash has been added; supply him with a clean bed; keep him dry and comfortable; let him have gentle exercise, and plenty of fresh air; limit the quantity of his food, and diminish its rankness; give bran with wash, in which you may add, for an average-sized hog, say one of 20 stone (8 lbs. to the stone), or 160 lbs. weight, a tablespoonful of the flour of sulphur, with as much nitre as will cover a sixpence, daily. A few grains of powdered antimony may also be given with effect. The animal, if in the summer, should be kept in the shade, and placed in a house facing the north, where he may have free access of air of the coolest kind."

LETHARGY.

The symptoms of this disease exhibit themselves by the animal apparently labouring under depression, with the head drooping, the eyes occasionally red, a general torpor, and a great desire to sleep characterising the whole appearance. It is caused by the want of cleanliness, improper food, and bad air. In treating for it, the animal should be bled as copiously as possible at the back of both the ears, or at the tail. Besides this, administer an emetic, consisting of a decoction of chrometic flowers, or a dose of emetic in accordance with the size of the patient. After this, reduce the quantity of food usually allowed, and mix with each morning's meal a little sulphur and nitre.

LICE.

Mercurial ointment, tobacco-water, and turpentine, are the most effectual remedies for vermin, which are engendered by inattention to cleanliness, and often become exceedingly troublesome and annoying. Every animal affected with vermin should immediately be separated from its herd, to prevent the affection extending. Mr. Parkinson says, "the cause of vermin infecting animals, clearly arises, in a general way, from bad feeding, which occasions weakness of the blood; for," he adds, "if an animal be ever so lousy, by giving him strong food for a few days, the vermin will disappear, probably because the rich blood is poison to them." He considers that a free access to water for bathing, also occasional exposure to heavy rain, is not only necessary to the general health of swine, but a most excellent preventive of vermin.

MANGE.

Mange is, by some, supposed to be caused by the presence of a minute insect, called *acarus scabiei*, or "mange-fly," burrowing beneath the cuticle, and, in its progress through the skin, causing much irritation and annoyance. Others, again, ascribe it to a diseased state of the blood, which eventually conveys its morbid influences to the superficial tissues. But whatever may be the cause, the *symptoms* of the disease are sufficiently well known. These consist of blotches, scabs, and sometimes multitudes of minute pustules, on different parts of the body.

In treating for this disease, it is recommended, by Mr. Richardson, that the animal should fast for five or six hours; after which, to a pig of average size, give Epsom salts, 2 oz., in a warm bran wash. This quantity is, of course, to be increased or diminished as the size may require it; but would suffice for a pig of from 15 to 20 stone (8 lbs. to the stone). It should be previously mixed with a pint of warm water, to which should be added about half a gallon of the warm bran wash. It will act as a gentle purgative, and be found highly beneficial.

Give afterwards, in every meal, for three days or a week—according as you observe the state of the disease—one tablespoonful of flour of sulphur, and as much nitre as will cover a sixpence. When you perceive the scabs begin to heal, the pustules to retreat, and the fiery sores to fade, you may pronounce your patient cured. But, before that pleasing result will make its appearance, you will perceive an apparent increase of violence in all the symptoms—the last effort of the expiring malady, as it were, ere it finally yields to your care and skill.

There are, however, some very obstinate cases of mange occasionally to be met with, which will not be so readily subdued. When the above mode of treatment has been put in practice for fourteen days, without effecting a cure, prepare the following:—

Train oil	1 pint.
Oil of tar	2 drachms.
Spirits of turpentine . .	2 „
Naphtha	1 „

Add as much flour of sulphur as will form the above into the consistence of a thick paste. Rub the animal, previously washed, with this mixture, and let no portion of the hide escape. Keep the pig dry and warm after this application, and suffer it to remain on the skin for three entire days. On the fourth day, wash it off once more with soft soap, adding a small quantity of *soda* to the water. Dry the animal well afterwards, and allow it to remain quiet, having again changed its bedding for a day or so. Continue the sulphur and nitre as before. The patient being convalescent, whitewash the sty; fumigate it, by placing a little chloride of lime in a cup, or other vessel, and pouring a little vitriol upon it. In the absence of vitriol, however, boiling water will answer nearly as well.

MEASLES.

Mr. Youatt describes this disease as rather a sub-cutaneous than an actual affection of the skin, consisting of a large number of small watery pustules, which take up their seat between the skin and the fat, and scatter themselves, besides, throughout the cellular tissue and the adipose matter. Some have supposed it to be a milder form of leprosy—a supposition which has a good deal to support it. The measles in the hog is not always fatal; but it has a very deleterious effect upon the quality of the flesh, making it pale, flabby, tasteless, and little disposed to take salt. In the adoption of remedial measures, the animal should be made to fast for twenty-four hours, and then have a warm drink, containing an ounce of bole armenian, and a drachm of carbonate of soda. Cleanliness should be carefully attended to; and at every feeding, or three times a day, it should be given thirty grains of flour of sulphur, and ten of nitre. The ancients treated a hog affected with the measles in the following manner:—After being put into a sty, and kept three days and nights without food, they took five or six apples, picked out their cores, and filled up the holes thus made with flour of brimstone. The holes were then stopped, and the apples thrown to the measly hog. He first tasted one or two, then one or two more, until he ate them all. He was thus treated for five or six days, by which time he was quite well, and as wholesome as ever.

MURRAIN.

The murrain bears a great resemblance to leprosy in its symptoms, with the addition of shortness of breath, staggering, and a discharge of viscid matter from the eyes and mouth. The treatment should consist of cleanliness, coolness, purging, bleeding, and limitation of food. Cloves of garlic have been recommended to be given. Garlic is an antiseptic; and as, in all those febrile diseases, there exists, more or less, a tendency to putrefaction, it is not improbable that it may be found useful.

PARTURITION.

Of all domestic animals, the pig suffers least from parturition. This, however, is not a disease; still, as it frequently requires surgical care, we have placed it in this chapter. No animal is so easily delivered as the pig, which, when her *time is near*, generally discovers considerable uneasiness; first, by being angry with every one of her species that happens to fall in her way, and then by collecting straw, and carrying it to the place she seems to have chosen to litter. She must not be interrupted in this, or prevented from doing it. It is

her nature thus to act; and when that is satisfied, she will be more reconciled to her condition. When her bed is made, she should be taken into a house somewhat dark, about eight or nine feet square, which will be room sufficient to admit of her turning herself in every direction. Mr. Richardson recommends for this, a lath to be run round the house, six inches from the ground, and six from all sides of the house, well stayed below, and on each side, by perpendicular and horizontal pieces of wood. This will prevent her lying close to any one side of the house, and keep her from crushing to death any of her offspring during the throes of parturition. At the commencement of her troubles, attention is necessary, to see that she is all right. She must be kept as still as possible, unless needing help, which is not often the case. It does, however, occur; as, when a false presentation, a sinking of the pig into the uterus, instead of its being presented in the vagina, or a contracted orifice shows itself. In the latter instance, a veterinary surgeon, of correct anatomical knowledge, is indispensable. The most usual false presentation is when the pig comes sideways, and so chokes the passage. In such a case, a mere turn with the hand will make things as they should be. If the pig has sunk down, it may be necessary to have a child's hand introduced, to raise up the young animal to its proper position. This will succeed when all other methods fail. As soon as each pig is delivered it should be placed before its mother, and it will soon begin to select its teat. Once selected, it will generally keep to it, if its right is not disputed by a stronger brother. If any pig should be extremely weak, and the weather very cold, it may be taken near the fire, and wrapped in flannel. So soon as parturition is completed, the sow will begin to cleanse—or, in other words, eject the placenta; which, when accomplished, should at once be removed, or she may begin to eat it, or learn from it to devour poultry, lambs, and, very probably, her own produce. As parturition usually begets thirst, let the sow have a quart of slightly warmed milk, thickened with a little bran. This is one of the best of medicines. As soon as she has cleansed, and all the young ones have been suckled, she should be gently driven out to stale. "A little care of her bowels, plenty of bran and milk food, given in small quantities, with frequent turning out for short periods in a sheltered place, will be necessary at first. If much fever or constipation should take place, a little sulphur—two heaped teaspoonfuls—in her milk will relieve her; nor will she refuse the milk which contains it, if it is thickened with a little wheat meal. Barley, and even oatmeal, must be avoided for the first three or four days. Afterwards she may have any kind of food whatever, except meal, which, useful as it is to store pigs, should never be given to those that are suckling."

QUINSY.

This disease consists of an inflammatory affection of the glands of the throat; is of frequent occurrence, and often proves fatal. Acidulated drinks, tonics, cleanliness, warmth, and strict attention to diet, accompanied with active cautery to the root of the evil, is the treatment prescribed. In Mr. Richardson's treatise, we find shaving away the hair, and rubbing the parts affected with tartar emetic ointment, recommended. "Steeping with very warm water is considered useful. When external suppuration takes place, it may be regarded as rather a favourable symptom than otherwise. In this case, wait until the swellings are thoroughly ripe; then, with a sharp knife, make an incision through the entire length, press out the matter, wash with warm water, and afterwards dress the wound with any resinous ointment, which can be obtained from the nearest apothecary. If this cannot be obtained, a very tolerable substitute may be made by blending yellow soap with coarse brown sugar."

RABIES.

This is one of those diseases which is, perhaps, developed in the greatest possible degree in the pig. All hope of recovery should be at once abandoned, and the animal slaughtered by shooting, and buried whole. If there is any chance of preventing the affliction, it is by immediate incision of the part where the animal has been bitten, and an application of the cautery. Medicines may alleviate the symptoms, but the disease is incurable.

SWELLING OF THE SPLEEN.

In the hog the spleen is of great length, and, throughout its whole extent, of nearly uniform thickness and breadth. The symptom which indicates the disease called ratille, is perceived by the animal leaning towards one side, bending towards the ground, and drawing itself together, as it were, from internal suffering. The cause of this proceeds from overfeeding, which, in the animal, has injured the condition of the secretions, and obstructed the excretory ducts. As a curative, strong aperients, to produce copious evacuations, are recommended; also bleeding, if the disease has continued some length of time. French veterinarians recommend the expressed juice of the leaves and tops of wormwood and liverwort, to be given in quantities of half a pint to a dose. The decoction of these plants, produced by boiling them in soft water for six hours, is more readily obtained than the expressed juice; and this may be given in doses of from half a pint to a pint and a-half, according to the size, age, &c., of the patient. Scammony and rhubarb, mixed up in a bran mash, or with Indian meal, may be given the following day, or equal portions of blue-pill and compound colocynth pill, formed into a bolus with butter; and the animal, having been kept fasting the previous night, will probably swallow it. If not, it is recommended to keep the pig fasting for a couple of hours longer, and then it will take it. Lower the diet, and keep it on reduced fare, with exercise, and, if you can manage it, *grazing*, until the malady has quite passed away. If you then wish to fatten, do so gradually. Be cautious of at once restoring the patient to full diet. Indeed, it would be better to keep it for a month as a store; and then feed at regular intervals, always removing whatever food is left from each meal.

SPAYING.

Spaying of female pigs is an operation which usually requires considerable care; and is generally performed when the pig is about three weeks old. The whole litter is usually cut at prices varying, in different localities, from 1*s.* 6*d.* to 2*s.* 6*d.* per litter, great or small. In performing the operation, the little animal is first laid on its right side, and the two hind legs are stretched out straight, so as to allow the mid-flank to come fairly under the eye and hand of the operator. An incision, about two inches long, is then made with a round-pointed knife, and the thumb and finger are introduced to search for the ovaries, which, from their being separate at one end, and presenting a convoluted or knotted appearance to the eye, are easily found. These are collected together, and folded in a downward direction over the edge of the wound. When the operator finds that all are exposed, he cuts them by a little pressure of the knife towards the skin, and the uterus falls back into its place. He now stitches up the orifice, and the animal usually very soon recovers. The operator should clean his knife well after every cut; secure the whole of the ovaria, and be careful not to stitch up any of the intestines with the skin. If this be done, death is almost certain to follow. Though this operation is usually performed at or before the pig is a month old, it may be safely done at any reasonable age of the animal.

STAGGERS.

This complaint is caused by excess of blood to the head. Bleed freely from behind the ears, and purge.

SURFEIT.

This is another name for indigestion. The symptoms are—loss of appetite, swelling of the region about the stomach, &c., and frequently throwing up the food. The illness will, in general, pass away of itself, provided the animal be kept from any kind of food for a few hours. A small quantity of sweet grains, with a little bran wash, may then be given, but not nearly so much as the animal will take. For a few days the food had better be limited in quantity, and also be of a washy, liquid nature.

TETANUS.

The common name for this disease is Lockjaw, and is by no means an unfrequent malady in pigs. It is often produced in young ones by castration, especially if, after this operation, they are highly fed for a few days. The disease is frequently fatal, and soon brings the life of

the patient to a termination. Bleeding, lotions, warm baths, and friction, with stimulating oils, are all recommended; also purgatives, if the mouth can be forced to admit them; if not, anodynes and enemas must be given.

TUMOURS.

Tumours, or hard swellings, make their appearance on different parts of the animal's body. Give aperient medicines; keep the animal clean, and administer a change of wholesome food.

These are all the principal diseases to which swine are subject. The remedies accompanying them are such as have been found most effectual; but where these fail, a skilful practitioner should be called in, that the life of a valuable animal may not be sacrificed.

MEDICINES USED IN THE TREATMENT OF DISEASES IN SWINE.

ANTIMONY.—This is rarely given alone; but, in combination with sulphur, it forms a cooling and cleansing medicine. When combined with sulphur, hog's-lard, or palm or train-oil, it forms the common mange-ointment.

ARSENIC.—Used in cases of disease of the skin. To form a solution of sufficient strength for external application, use from one ounce to an ounce and a-half, dissolved in a gallon of water. Arsenic, in the metallic state, is of a bluish-white colour, subject to tarnish, and grows first yellowish, then black, by exposure to air. It is brittle, and, when broken, exhibits a laminated texture. Its specific gravity is 5·763. In close vessels it sublimes entire at 356° F., but burns with a small flame if respirable air be present. The arsenic met with in commerce has the form of a white oxide. It is brought chiefly from the cobalt works in Saxony, where zaffre is made. Cobalt ores contain much arsenic, which is driven off by long torrefaction. The ore is thrown into a furnace, resembling a baker's oven, with a flue, or horizontal chimney, nearly 200 yards long, into which the fumes pass, and are condensed into a greyish or blackish powder. This is refined by a second sublimation in close vessels, with a little potash, to detain the impurities. As the heat is considerable, it melts the sublimed flowers into those crystalline masses which are met with in commerce. Arsenic is used in a variety of arts, and enters into metallic combinations, wherein a white colour is required. It is a deadly poison when received into the stomach. The best remedies are mucilaginous liquids and milk. Syrups and linseed tea are of service. Vomiting should be excited by tickling the throat with a feather.

ARSENIC ACID is formed by the distillation of the white oxide with nitric acid; or by exposing it to chlorine vapour. It is a white concrete substance. The arsenic acid has a sour, and, at the same time, a metallic taste. It reddens vegetable blues, attracts humidity from the atmosphere, and effervesces strongly with solutions of alkaline carbonates. With alkalies, earths, and oxides, it constitutes a class of salts, called arseniates. The arseniate of potash was introduced into the *materia medica* by Dr. Fowler, for the cure of agues; but it is not used in the diseases of swine.

CALOMEL.—This drug being very dangerous, should, where used at all, be given with extreme caution. In combination with an equal portion of tartarised antimony, it may be administered in cases of great emergency. To form an active emetic, take from two to three grains.

CREOSOTE.—In cases of virulent cutaneous eruptions this is a useful medicine.

CROTON OIL.—In cases of severe constipation, from one to three drops may be given of this powerful purgative.

DIGITALIS.—Valuable as a sedative in cases of fever.

EPSOM SALTS.—A purgative, used in almost every ordinary case. In a general way, the dose is from half an ounce to an ounce and a-half.

GENTIAN.—Used as a stomachic. A portion of it should be given with every aperient draught, with great care and consideration.

GINGER.—Used as a tonic. It is also an excellent stomachic.

LINSEED OIL.—In cases of considerable intestinal inflammation, this may be given as a purgative.

MERCURIAL OINTMENT.—In conjunction with the sulphur ointment, this is used for the mange and scab. The proportions are, one part of the former to eight parts of the latter.

NITRE.—In febrile cases this is used as a cooling medicine. The dose is from one to two drachms, dissolved in the water the animal drinks.

PALM OIL.—This is esteemed the most valuable emollient for forming the basis of all ointments for cutaneous eruptions. Under the name of *Palmæ*, Linnæus arranged several genera, which he placed apart in an appendix to his work. The same plants constitute one of the seven families or tribes into which all vegetables are distributed by Linnæus, in his *Philosophia Botannica*. They are defined to be plants with simple stems, which, at their summit, bear leaves resembling those of the ferns, being a composition of a leaf and a branch; and whose flowers and fruit are produced on that particular receptacle, or seat, called a spadix, protruded from a common calyx, in form of a sheath or scabbard, termed by Linnæus "spatha."

SALT.—Valuable for purifying the blood. A little of it should regularly be mixed with the food of the animal.

SULPHUR.—An excellent cooling medicine, and one of the best, if not the best, gentle aperient for common use. In mange-ointment it forms the principal ingredient.

TARTAR EMETIC.—Used as an emetic.

TOBACCO.—A decoction of this plant, when mingled with equal parts of digitalis, is efficacious in cases of mange and other cutaneous diseases.

TURPENTINE.—Useful in cases of worms, which it destroys. There is no danger in administering it to swine.

VINEGAR.—Used in cooling fomentations. Its specific gravity varies from 1·0135 to 1·0251; and it differs also in its other properties, according to the liquid form in which it has been procured. It is very subject to decomposition; but Scheele discovered, that if it is made to boil for a few moments, it may be kept afterwards for a long time without alteration. Besides acetic acid and water, vinegar contains several other ingredients, such as mucilage, tartar, a colouring matter, and often, also, two or more vegetable acids. When distilled at a temperature not exceeding that of boiling water, till about two-thirds of it have passed over, all these impurities are left behind, and the product is pure acid diluted with water.

DIVISION VII.

POULTRY.

CHAPTER I.

ORIGIN OF THE DOMESTIC FOWL.

From the earliest records of time, the cock seems to have been known to man, and to have held an important place in his estimation, not only on account of his qualities as a table fowl, but on account of the heroic courage with which, as a game bird, he is animated in combating for victory over an antagonist. His origin, however, is involved in obscurity. We have no means of deciding where was situated the Eden in which the Adam and Eve of our domestic fowls were first placed. All, we believe, are agreed that it was in the East; but it is very singular that they are no longer found in a wild state, any more than the camel is; that their originals are a matter of theory and speculation rather than of certainty; and that, if we assign them to India, we can do so only by a process of reasoning based upon probability, rather than fact. Presuming, however, that India was the country of their origin, we find it stated, on the highest authority, that the range of the wild common fowl does not extend, westward, beyond the lofty ranges of mountains that form the natural boundary of India in that direction; and yet the domestic bird is said, by the same authority, to have been common among the western nations from the remotest antiquity. As different views of this subject have been taken by different writers, we will bring the theories of each before the reader in a form as condensed as we possibly can.

One supposes that the early patriarchs, before leaving the eastern cradle of mankind, were fortunate enough to possess themselves of an individual wild species of cock and hen; which, by some means, they managed to tame, and attach to either themselves or the locality in which they settled. By constant care these became domesticated; and their offspring, inheriting the attachments of their parents, became still more civilised, and consequently less inclined to wander from the place of their birth. To what species, however, did this first pair belong? Mr. Edward Blyth, Curator to the Asiatic Society's Museum at Calcutta, and one of the ablest ornithologists of the day, adheres to the opinion that *all* the domestic varieties of fowl are derived from *one* wild species of jungle fowl—namely, from that common in the Bengal Presidency, and the countries to the east and south-east of it, and not at all from *Gallus Sonneratii*, as has been so often suggested. "In the formerly Burmese province of Arekan," says Mr. Richardson, following Mr. Blyth's argument, "many of the tame hens are scarcely distinguishable from the wild, and only so by being a little coarser in the leg, with a tendency generally to a greater development of comb; and these hens, hardly removed from the wild, are free breeders. Domestic cocks, of various breeds, may often be found to match, feather by feather, with the wild bird, even some of tolerably gigantic dimensions; and the voice is absolutely that of an English game fowl. This is of importance, as the notes of the two other Indian species are so utterly different; the difference of voice among the races of domestic fowls being as nothing in comparison. Moreover, the wild hen signifies aloud, after the same fashion as the tame one, her deposition of an egg; and thus it is that the eggs are occasionally found, though not very commonly."

Mr. Blyth remarks, in reference to the researches of M. Snudevall—"He might well have sought in vain for traces of the wild *Gallus Sonneratii* in the domestic poultry of India, inasmuch as though, curiously enough, I have found *that species of South India far more easily domesticable than the Bengal jungle fowl*—the

latter is, *beyond all question*, the exclusive aboriginal stock from which *the whole of our domestic varieties* of common poultry have descended."

Mr. Blyth continues—"However different these may be, whether the silky fowl of China, the gigantic Chittagong race, or the feather-legged bantams of Burmah, their *voice* at once and unmistakably proclaims their origin, and is as different as can be, in every cry, from that of *G. Sonneratii;* besides that we continually meet with common domestic cocks which correspond, feather by feather, with the wild bird, the peculiar notched comb of which is again retained invariably, even when the comb is double or compound. *This much premised, however, it is remarkable that the domestic poultry of India do not approximate to the wild race in any respect more closely than the common fowls of Europe; and I have sought in vain for traces of intermixture of jungle-fowl blood in districts where the species abounds in a state of nature.*"

A friend of Mr. Blyth's, in one of his sporting excursions in Cuttack, came upon the nest of a jungle hen, in the hole of the trunk of a tree. It contained nine eggs, which he took home with him, and placed under a common hen. The chickens were all reared, and lived with his other poultry, being permitted to go at large to feed during the day, whilst, at roosting time, they returned home with the other fowls. He, however, set no particular value on them; but observed them sufficiently to be able to state that they interbred with the other fowls, and that the breed finally merged in the general stock. From this, taken in connection with other facts, Mr. Blyth is certain that our domestic poultry are derived from this particular wild species; and of the tame pea-fowl being descended from the vital Indian one. He further says, that the peculiarities of many of the domestic breeds are not such as occur among any wild birds whatever; such, for instance, as the silk fowl, with its black skin and periosteum; the frizzled birds, with their feathers twisted the wrong way; those with supernumerary toes; and the feather-legged varieties. This theory, however, is apt to startle us when we think of the gigantic Cochin-Chinas and Malays, the tiny Bantams, the superb Polish, and the droll Rumples and Negro fowl, being all the progeny of one single Indian species. This supposition, however, is coincident with that maintained by some in reference to the origin of all the varieties of the dog.

Mr. Blyth goes on to say—"It is a curious instance of how little is currently known of the zoology of India, that, to this day, authors who write on the history of the common fowl, generally repeat the statement, that 'its original stock is very uncertain; but it is supposed to be descended from a wild species still met with in the island of Java!' The truth being, that the genuine wild common fowl is familiarly known to every sportsman in all Northern India, and is with justice highly prized as a game bird—abounding in all suitable localities, from the sub-Himalayan region on the north, to the Vindhyan range on the south, and spreading farther southward, along the eastern coast of the peninsula, to some distance beyond Vizagapatam; while to the eastward it likewise abounds in Assam, and all along the eastern side of the Bay of Bengal, throughout the Burmese countries, the Malayan peninsula, Java, and Sumatra. *G. Sonneratii* begins to replace it on the Vindhyan range of hills, bordering the great table-land of the peninsula to the northward; and wholly replaces it in Southern India generally; while in Ceylon two other wild species occur, the hen of one of these being figured by the name of *G. Stanleyi*, in Hardwick's *Illustrations*."

In support of his position, Mr. Blyth bids us look to the crest of a Polish fowl, and see how different it is to the crest of the pea-fowl, or of the *Impeyan Lophophorus*, consisting of hackles similar to those of the saddle and neck. The same is the case with the feather-legged breeds. It is observed that the tarsal plumelets of owls, grouse, &c., are of a character peculiar to themselves; while the foot plumes of pigeons, and some other fowls, bear a striking resemblance to those of the corresponding joints of the wings. That animals long domesticated fall into singular varieties, we have sufficiently shown in the case of the dog, which has entirely lost the uniformity of appearance which, with the exception of a few, is found in the numerous wild animals belonging to that species. Even among fish

there are endless varieties. The domesticated Chinese gold fish is continually varying as to the number of both its fins and tails. In place of one, some of these have three tails; whilst, in point of shape, the changes are endless. These circumstances have a strong tendency to make us cease to wonder at the varieties found in other species of animals—in the dog and the domestic fowls. These are much more under the influence of domestication than the fish; they are in much more constant association with man; whilst the cross-breeding that is continually taking place amongst them, may be expected, in the course of time, to produce feathers, so different from those which characterised their originals, as to give them all the appearance of a new and distinct species. In the common fowl we might expect extraordinary varieties. Every day experimentalists are trying to produce new breeds, which, in their turn, will produce other breeds, and so on, until the originals are lost, and an entirely different character of fowl is the result.

The principle that "like produces like," applies to fowls, as much as to the horse, or any other species of animal; and it is from a knowledge of this fact that the breeder acts when he desires to produce another variety in such animals as he may have under his care, and will breed together.

With respect to cross-breeding, Mr. Tegetmeier remarks:—"Should it be deemed desirable to cross the Dorking, for the purpose of producing a hardier fowl, such a plan as the following seems to offer the best chance of success; being based upon the fact that, in cross-breeding, the pullets usually resemble the mother, and the cockerels the father. Early in the year, so as to obtain a brood in May, put two or three large Dorking hens with a short-legged compact Cochin cock, either a common buff, or a grey Shanghai, or Brahma Pootra. From the chickens, select those pullets possessing, in the greatest degree, the Dorking character—viz., having fine bone, short white legs, and compact body, square on the limbs; in the following season mate them with a good Dorking cock. The progeny will be three-fourths Dorking; and, if care is taken in the selection, will show very little trace of Cochin blood; whilst the size and constitutional hardihood of the breed would be much improved, by the infusion of new blood from the hardiest of races. One caution, however, would be requisite: if these birds were allowed to breed amongst themselves, they would occasionally throw back to the Cochin; it would be therefore necessary to mate the pullets again with a Dorking cock; and, as in all cases of breeding for size and strength, great care must be taken to avoid breeding closely—viz., from birds related to each other." Here is the secret of variety, which we see is the simple and natural effect of cross-breeding.

Regarding the *process* of domestication, considerable weight is laid on the difference of disposition exhibited in different individuals of the same species, whether they have only been *tamed*, or fully domesticated. In the breeding of horses, and even of cattle, disposition is greatly considered; and the breed of a vicious animal is avoided, whatever may be the excellences of its physical conformation.

That the domestication of all our reclaimed species has been gradual, and originally accomplished by those whose lives were chiefly devoted to pastoral pursuits, may be reasonably inferred. In accomplishing this, the process would be both simple and natural. The dam would be either killed or taken from her offspring, which would be petted and fed by an individual of the household, to whom they would naturally become attached. As they would be always provided with food, they would not be forced to seek it in those wild places to which their originals were compelled to confine themselves; and from being continually under kind influences, and the sound of the human voice, they would gradually lose their natural ferocity, and become tame. From being tame they would soon be reduced to a state of domestication; and in the multiplication of their species, varieties would be thrown, and perpetuated by the art of those who would naturally make it their study to watch their dispositions, and mark whatever distinctions, in their physical forms, might appear. But, however plausible these arguments may seem, it is somewhat extraordinary that we have never been able to tame a quail, a partridge, or a pheasant. We have never been able to attach the Argus pheasants to our dwellings, as we have done the peacock; nor

the wolf as we have done the dog. How is this? How is it that the wild animals, with which we are acquainted, are now found to be so difficult to be brought into a state of domestication? Are we in these matters the inferiors of those who lived in pre-historic, or even anti-traditional times?—for it must have been in these that cattle and poultry were brought under the subjection of a household. These are questions easier put than answered; but, as the subject may be found discussed in *Ornamental Poultry*, by Mr. Dixon, we must refer those who are interested in the subject to the pages of that gentleman's work.

In placing the various arguments, by the different investigators, before his readers, Mr. Richardson says—"It is candidly acknowledged—and a very important admission it is, though there is no possibility of refusing to make it—that the wild types of several of our domestic animals no longer exist, while that of our fowls is thus precisely indicated! The wild origin of the camel in the old world, and of the llama, and alpaca, in Chili and Peru, and even of the little guinea-pig, which was found *domesticated* among the natives of Brazil, is quite unknown. Neither the guanaco, nor still less the diminutive vicugna, will suffice for the former, nor the *restless* and other wild cavies for the latter. Respecting the wild original of such an every-day and familiar creature as the domestic cat, our knowledge is anything but superabundant. Great doubts are entertained whether either the true wild horse, or the true wild ass is known, or the parent of the humped ox (a most decided species); and it is far from clear that the so-called wild yaks are the true origin of the tame breeds. Amongst birds, it is not pretended, or even hoped, that the wild stock of the knobbed or China goose (*Anser Cycnoides*) is still in existence; although there must be in China several tame breeds of that remarkable bird. The original type has probably been exterminated for ages."

Of *some* of our domestic creatures, therefore, there is no idea, among our best-informed naturalists of the present day, of indicating the wild ancestor; but of others such a notion *does* prevail. Respecting a few, there can be little or no doubt. Of the Indian buffalo, there can be no mistake; nor of the hogs of different countries, from several nearly-related wild races, though the origin of the Chinese hog is probably lost. Amongst domestic birds, the pea-fowl, the turkey, and the guinea-fowl, come from an undisputed parentage, which are still found wild in their native home; but there are other companions, of which we are unable to speak with the same degree of certainty. It is doubted whether we know the true wild origin of the domestic canary-bird. Mr. Blyth actually remarks, "that the *albinos* (or what can we call them?) of all *green* birds (amongst others, the yellow wagtail) are yellow; for instance, parrots, bee-eaters, &c.;" and, as he observes, the tame canary-bird has a true albino eye! The origin of the *cage* turtle-dove is uncertain. The voice of the wild *Turtur risorius* is quite different. Mr. Hodgson has clearly shown that certain very large and short-tailed Asiatic breeds of sheep are derived from the wild *ammon;* the fighting rams of India may have their origin in *ovis vignei;* but though the species of Asiatic wild sheep are remarkably numerous, there is no other that seems to have contributed to any domestic race; and it is probable that the wild origin of the long-tailed, tame, and other sheep, is no longer in existence. The list of "doubtfuls" might be extended; but the object here is merely to show that there is such a list, and to impress it on the reader's attention.

Whether the several varieties of Domestic Fowl are of ascertained or doubtful descent, must always remain an open question Naturalists, generally, think that it required more than one wild type to produce the many different species which we now find adorning the poultry-yard; whilst Mr. Blyth, who has had great opportunities of observation, adheres to the idea of one Indian species being the common parent of all the forms, sizes, and colours which exist. Notwithstanding this, however, there are circumstances which he acknowledges and points out, suggesting considerable difficulties in the way of establishing his theory.

As other naturalists affirm that the wild type of our tame cocks and hens has no existence, it is no more than fair that their reasons for entertaining such an opinion should be stated. Geological progress has proved that many species of beasts and birds have become extinct, and are now, instead of walking

on the face of the earth, or soaring through the fields of the air, lying buried in the depths of the morass, or imbedded in the various strata which help to form "the great globe" which we inhabit. In the *Geology* of Sir Charles Lyell, we find a notice of some of the species that have become extinct in our own island. Besides those which have been driven out from some haunts, and, everywhere, reduced in number, there are a few which have been wholly extirpated; such as the ancient breed of indigenous horses, the wild boar, and the wild oxen; of which last, however, a few remains are still preserved in the parks of some of our nobility. The beaver, which was eagerly sought after for its fur, had become scarce at the close of the ninth century, and, by the twelfth century, was only to be met with, according to Giraldus de Barri, in one river in Wales, and another in Scotland. The wolf, once so much dreaded by our ancestors, is said to have maintained its ground in Ireland so late as the beginning of the eighteenth century (1710); though it had been extirpated in Scotland thirty years before, and in England at a much earlier period. The bear, which in Wales was regarded as a beast of the chase, equal to the hare or the boar, only perished as a native of Scotland in the year 1057.

Many native birds of prey have also been the subjects of unremitting persecution. The eagles, larger hawks, and ravens, have disappeared from the more cultivated districts. The haunts of the mallard, the snipe, the redshank, and the bittern, have been drained equally with the summer dwellings of the lapwing and the curlew. But these species still linger in some portion of the British isles; whereas the large capercallie, or wood grouse, formerly natives of the pine-forests of Ireland and Scotland, have been destroyed within the last fifty years. The egret and the crane, which appear to have been formerly very common in Scotland, are now only occasional visitants.

"The bustard (*Olis tarda*)," observes Graves, in his *British Ornithology*, "was formerly seen in the downs and heaths of various parts of our island, in flocks of forty or fifty birds; whereas it is now a circumstance of rare occurrence to meet with a single individual." Bewick also remarks—"That they were formerly more common in this island than at present; they are now found only in the open counties of the south and east, in the plains of Wiltshire, Dorsetshire, and some parts of Yorkshire." In the few years that have elapsed since Bewick wrote, this bird has entirely disappeared from Wiltshire and Dorsetshire.

The extinction of such a species as the dodo (for we must conclude, we fear, that this bird is blotted out from the catalogue of living animals) is remarkable.

"The most striking example of the loss, even within the last two centuries, of a remarkable species, is that of the dodo—a bird first seen by the Dutch, when they landed on the Isle of France, at that time uninhabited, immediately after the discovery of the passage to the East Indies by the Cape of Good Hope. It was of a large size and singular form; its wings short, like those of an ostrich, and wholly incapable of sustaining its heavy body, even for a short flight. In its general appearance it differed from the ostrich, cassowary, or any known bird.

"Many naturalists gave figures of the dodo, after the commencement of the seventeenth century; and there is a painting of it in the British Museum, which is said to have been taken from a living individual. Beneath the painting is a leg, in a fine state of preservation, which ornithologists are agreed cannot belong to any other known bird. In the museum at Oxford, also, there is a foot and a head, in an imperfect state; but M. Cuvier doubts the identity of this species with that of which the painting is preserved in London.

"In spite of the most active search, during the last century, no information respecting the dodo was obtained; and some authors have gone so far as to pretend that it never existed; but, amongst the great mass of satisfactory evidence in favour of the recent existence of this species, we may mention that an assemblage of fossil bones were recently discovered, under a bed of lava, in the Isle of France, and sent to the Paris museum by M. Desjardins. They almost all belonged to a large living species of land-tortoise, called *Testudo Indica;* but amongst them were the head, sternum, and humerus of the dodo. M. Cuvier had many of these valuable remains in Paris, and

asserted that they left no doubt in his mind that the huge bird was one of the gallinaceous tribe."

When new species, multiplying widely, and requiring large supplies of food, are introduced into a country, the older tenants of the soil *must* necessarily be reduced by want, and some classes must be destroyed. The millions of wild cattle and horses which are established in the New World, from the latitude of 25° N. to 40° S.; the sheep and goats which have multiplied enormously there, as well as the cat and the rat, the latter having been introduced unintentionally in ships; the dogs which have at different periods become wild in America, and hunt in packs, like the wolf and the jackal; and "the many millions of square miles of the most fertile land, originally occupied by a boundless variety of animal and vegetable forms, which have been already brought under the dominion of man, and compelled, in a great measure, to yield nourishment to him, and to a limited number of plants and animals, which he has caused to increase; must convince us that the annihilation of a multitude of species has already been effected, and will continue to go on hereafter, in certain regions, in a still more rapid ratio, as the colonies of highly-civilised nations spread themselves over unoccupied land."

Those who have closely studied the poultry question have doubted whether living creatures do undergo, from generation to generation, such changes as would be evidenced by the conversion of a wild jungle fowl into the marked and distinct sorts which constitute our races of domestic fowls. "They doubt the progressive transmutation of species, and are more inclined to regard them as immutable. That animals *do* vary, they readily allow; but they also believe there is a limit to their variation. The pea-fowl, for instance, and the guinea-fowl, ought to have branched off into as many breeds as the common fowl, if the theory of derivation from the jungle fowl were true. These innovators also say that each creature has its natural disposition implanted in it from the first, which no art of man can alter; that there are tameable and untameable species of animals, unconquerably shy, and unhesitatingly confiding; that they are reclaimable, partially reclaimable, and utterly irreclaimable; and that those authors who, by a pleasant legerdemain, so easily transform one of the Indian *galli* into a barn-door fowl—who put the Sonnerat's jungle cock, or perhaps some quite apocryphal bird beneath a bushel, hocus-pocus a little, lift up the cover, and then exhibit a veritable chanticleer—write as if they had only to catch any wild bird in the woods, turn it into a court-yard for a week or two, and make it straightway as tame as a spaniel;—an educational feat as yet impracticable with most of the creatures which fall into our hands."

Taking these various arguments into consideration, it has been suggested that many varieties of fowl are aboriginal (though no longer to be met with in a wild state), and are not the *results*, but the *protegées* of domestication; that the wild race, the one which formerly ranged the primæval woods and jungles, is now extinct; and that many of our domestic animals are the survivors of extinct races—survivors, because domesticable—of extirpated, because defenceless creatures—and many natural historical difficulties vanish, and become reconcilable with what we see around us.

There are other theorists who think that the various breeds of poultry bear an analogy to the different races of mankind, as found in the different parts of the habitable globe. "Either," they say, "you must commit the heresy of asserting that Adam and Eve were not the common parents of *all* mankind, or you must give up your doubts about domestic cocks and hens. Either you must allow the native Australian man to be a distinct and peculiar species of *Homo*, or you must admit the more than probability of the Bengal jungle fowl being the original type of our domestic fowls." In meeting this argument, Mr. Richardson observes—that, "passing over the fact that no *one wild original species of man* is pointed out to fulfil the office of *type* to the existing human inhabitants of the world, in the sam way as the Bengal jungle fowl is supposed to be for domestic fowl—omitting all that, it may be fairly remonstrated that the argument is not a generous one, inasmuch as it takes an unfair advantage of people's dislike to shock the feelings of others, especially in matters which, in the slightest degree, touch upon Scripture history; it is exactly the same kind

of opposition as was made to geological truths some years ago. Were an observant and reflecting naturalist, driven by pressure and persecution, to make such a recantation, it would be of as little value to his opponents, as a triumph, as Galileo's denial of his deliberate statement that the earth moved; and might, like his, be quietly followed by the private assertion that the earth *did* move nevertheless. But suppose that, to avoid the charge of insincerity and cowardice, our speculator were to seize the dilemma by one of its horns, and render himself liable to be suspected of believing the native Australian man to be a distinct and peculiar species; other naturalists, of deservedly high reputation, have previously entertained the same suspicion, and declared their doubts whether the negro and the European have proceeded from the same origin. It is impossible to say that much has yet been done in the way of taming and incorporating into civilised Anglo-Saxon society any one tribe of Australian natives. They still remain, as yet, both physically and morally undomesticated. What are the prospects of the aborigines of Tasmania? Even the more domesticated New Zealanders diminish in numbers, while they are trying to fall in with the ways of civilised life. Their *constitution* cannot stand it. Neither has the Red Indian proved a reclaimable animal. Captain Fitzroy's well-meant experiment with the boy and girl from Terra del Fuego cannot be called a successful one. Darwin's description of the *wild* men he saw there, in his voyage in the *Beagle*, impresses most readers with the idea of beholding a totally distinct species of human creature.

"Some people are bold enough to aver, that the more they consider, the more they are convinced that the solution thus given of the mystery about the derivation, or rather non-derivation of many domesticated from wild creatures, is correct; and they also feel equally assured that there are certain races of men, whom to concentrate and domesticate, is to destroy. Immense sums, and great pains have been extended on the education of children of the Australian aborigines. They are found docile; they learn to read and write, even more quickly than white children; but, as they attain the age of puberty, they either die, or take to the woods. A gentleman in Australia had two orphans, whom he saved amidst the slaughter of a hostile tribe. They were faithful even to death; one was killed at his side—but nothing could prevent them from periodically associating with their black brothers and sisters. The New Zealanders, on the other hand, are perfectly capable of civilisation; but, in spite of that, their numbers decrease."

The possibility that our domestic fowls are, perhaps, rather a chance possession than otherwise, is strengthened by the acknowledged fact that animals, in a state of nature, and unprotected, are liable to extermination, not only in consequence of the assaults of man, but from the persecutions of other species, often those most nearly allied to their own. A few years ago there was a violent onslaught made upon the hawk tribe, in consequence of their imagined propensity to destroy game. In some of the sporting journals and periodicals, letters appeared upon the subject; some fearing that the whole race of the *Falconidæ* would fall victims to the cruel prejudice which had risen against them; whilst others rejoiced in the destruction of these beautiful birds. One of the latter says—"Your description of the hen-harrier is excellent, &c. You will, I have no doubt, remember how plentiful hen-harriers and other hawks were here, when we took the ground; you will therefore scarcely credit it, when I tell you that I have not seen a hen-harrier for the last two years; I have exterminated them by trapping them at the remains of what they killed themselves. In five years we have killed upwards of 900 head of vermin; and the result is, that we have now five head of game for every one we had on our taking the moors. We have had two merlins' nests here every year since I have been here. They build in the long heather, similarly to the hen-harrier; I have known them carry grouse poults to their young heavier than themselves. The sparrow-hawk builds in trees, and is very destructive to grouse in the months of April and May; she kills principally the hen birds, these being, at this season of the year, very slow and heavy in their flight, and consequently fall a very easy prey; I have trapped hundreds of hen sparrow-hawks at grouse and partridges which they had

killed, but I never trapped the cock sparrow-hawk at the remains of a grouse or partridge, although I have frequently taken him with the remains of small birds that he had killed; I have known a sparrow-hawk take nine grouse poults to her nest in less than twenty-four hours. I have seen the sparrow-hawk build for years in succession in the same tree, although the hen bird was killed every year, and sometimes both birds. They sometimes build in an old hoddie's nest. When they build for themselves, their nest is very similar to that of a wood pigeon."

Here is an instance, amongst others that we have already adduced in the progress of this work, of the exterminating war which is occasionally made upon certain species of the lower kinds of animals; these, however, sometimes find defenders, and several rose up to propitiate mercy for the doomed hawks. One who signs himself "Merlin," says—"Of your numerous correspondents who have given their vote against the poor hawks, but one has attempted to discriminate betwixt the different species; and, although describing the most fatal mode by which each may be destroyed, he has not pointed out those against which game-preservers have no just cause of complain'."

In woodlands, the female sparrow-hawk, and on moors the hen-harrier (called sometimes the ringtail and glead), are the only species deserving of death for any breach of the game-laws. The former bird does destroy a few partridges and young pheasants during the summer and early autumn (although its principal quarry is the young wood and house-pigeon); the hen-harrier anything it can meet with, from a grouse to a frog upon the ground, over which it makes its daily beat. Against these birds, the pole-trap, so generally recommended, is almost useless, although certain to capture the harmless mouse-hunting little kestrel, as also the equally harmless long-eared owl, particularly when baited, as one correspondent advises, with a living mouse, which, he tells us, "is certain death to any hawk in the neighbourhood." One would have thought that this fact alone was sufficient to enlighten the writer as to the usual objects of pursuit amongst the birds he would exterminate. To the agriculturists the little hawks are of the greatest service, by destroying, in the course of the year, immense numbers of these true "pests of the farm;" and if they ever do interfere with the game-owner's property, it is by picking up a half-dead chick or two, artificially reared under a hen confined to the coop, and therefore incapable of defending her charges. To game, in a state of nature, they do no injury whatever. At certain seasons of the year, it would do little local good, even supposing all the charges against the birds were true, to destroy every hawk over a tract of country; because, being, like others of their feathered brethren, more or less migratory birds, the majority of those which, during the breeding season, frequent our woods and wilds, and elsewhere, and the comparatively few which remain in this country, shift their quarters before that period arrives.

We know how useless it is to attempt to argue against prejudice, and therefore shall refrain from pointing out how much enjoyment to the lovers of animated nature—and these are not a few—the presence of some of these victims to the game-keepers' art in the smiling landscape affords—particularly when, to this prejudice, is added the feeling which could prompt one writer to advocate the *hanging* of human transgressors "on the first lamp-post;" and in a subsequent epistle, when treating on his feathered foes, to recommend that the chain, by which the trap is secured to the pole, should be fastened about a foot from the top; by which humane contrivance, the hawk, when caught, is suspended mid-air by the mangled limb.

As there are a few remaining who still retain a love for the use of these birds, in the management of which, activity, both of body and mind, is required, it might be suggested to those who will catch them, that by the use of small traps without teeth, and where the jaws do not quite close, and are wrapped with some soft substance, as tow, profit may be combined with humanity; as they would find a ready sale of such birds as the peregrine, hobby, or merlin, if offered with unbroken limbs.

Were it not for the gamekeeper and the sportsman, the red-legged would soon get the upper hand of the grey partridge in many English counties; the Norway rat has made the black old English rat exceedingly scarce; and the mute swan of our parks and streams,

if carried to Australia, and suffered to fly wild there, would, in the course of years, drive the native black swan into as narrow quarters as the European settlers did the human aborigines of Tasmania. Domestication affords a refuge against this exterminating warfare, in which no quarter is given; but in which, species that refuse to accept the asylum, and which obstinately shout for "death or liberty," must take the consequences of their choice, and disappear.

A singular instance of extermination, as having occurred in modern times, is given by Mr. Richardson. "It happened in the island of Tristan d'Acunha, where poultry, introduced by the first settlers, became wild, and multiplied to an extraordinary degree. About 1822, cats having unfortunately been imported, began to multiply still more rapidly, and entirely destroyed the wild poultry, and much of the tame. Similar cases are very likely to have occurred in early ages, and point to the probable distinctness and antiquity of the present races of domestic fowls."

Having placed the conflicting theories before our readers, we may observe that the inquiry is not one of mere curiosity, but of secondary importance—*though it is extraordinary, that our efforts to tame the pheasant, the partridge, and the quail, have proved unavailing.* A fact of this kind has induced many to entertain the belief that the races of domesticated animals were never wild; and the following observations are not without weight upon this point:—

"In the first place, there is no evidence of a greater number of kinds of domesticated animals now in the world, than have been from the earliest period of history; and, in the next place, there have always existed as many kinds of domesticated animals as have been useful to man in his most civilised state. As the civilisation of man increased, so have the variety and quality of domesticated animals increased; but the number of their kinds has not enlarged. There were horses, asses, camels, dogs, cattle, sheep, and goats, in the days of Abraham, as well as now; and these constitute the largest proportion of our domesticated animals. Many attempts have been successfully made to tame single individuals of wild races; but such animals, though tamed, are in quite a different state from our domesticated animals. Some wild animals exhibit a degree of familiarity. The swallow builds her nest in our windows, and the robin enters our dwellings; whilst the blackbird and sparrow are constantly before us. This familiarity, however, does not amount even to tameness, far less to domestication. It appears, indeed, that wild animals are preserved *unchanged*, for the great purpose of Providence, throughout the globe, and that Nature has presented to man only such animals as are obviously most suited to his wants. With these he must be satisfied. What wild creature would he desire to substitute for any one of our animals? Should we desire it, Nature (*i.e.*, the Creator) has placed such a barrier in our way, that it is impossible for us to make a single wild creature available to our domestic purposes. We may exercise our ingenuity, judgment, and even caprice, in moulding the habits and qualities of domesticated animals to our tastes, wants, and conveniences. There the field of experiment is open to us—not to an unlimited, but to a great extent; but Nature will not permit us to make a single predatory excursion among her wild animals."

Of the power of man to impress modifications of great apparent amount on the forms and properties of animals and plants, there is sufficient proof to be found in the field of the farmer, as well as in the garden of the horticulturist. Every ox, sheep, and pig; every plant and apple; every cabbage and cabbage-rose, is an instance of the ease with which the natural constitution of organised beings may be changed, and of the wide difference which may be made from the progenitor of the stock, as it appeared when man received it from the hand of Nature. These changes, however, are only permitted, and not adopted by Nature, and endure only so long as man continues to extend to them his fostering care and supervision. Let him be taken away; let human labour no longer till the field, or prune the garden; tend, or feed domestic animals; and the scene soon changes. The natural war of the various tribes of the animal and vegetable worlds recommences. The species that had developed their secret powers whilst in a state of social alliance with the lord of the creation, when deprived of his assistance, are no longer capable of maintaining

their ground. The weak either perish, or are speedily destroyed, whilst the strong become fierce and pugnacious. The sheep and the ox become the prey of the dog and the wolf; whilst the garden-flower, renouncing the dress and habits of its artificial home, assumes those of the daughters of the field. All change. The bond which bound them together has been broken. The alliance has ceased between them; and the sweet flavour and beautiful exterior of the products of the orchard, are assailed by a democratic aggression of thorns and brambles. In this struggle they either perish, or preserve their place only by becoming as rude and as coarse as their neighbours. The crab, the sloe, and the weed may remain; but the fragrant apple, the luscious plum, and the curded cauliflower, are to be found no longer. Vicissitude has become the rule.

CHAPTER II.

THE DOMESTIC FOWL AND ITS VARIETIES; THE HAMBURGH; DORKING; GAME FOWL; SPANISH; POLISH; COCHIN-CHINA; MALAY; BANTAMS; RUMPLES; SILKY; NEGRO AND FRIZZLED; SCOTCH BARIES; BOLTON GREYS; PARIS SHOW.

THE HAMBURGH.

In treating of the varieties of our domestic fowl, we will confine ourselves to such as may be deemed the most suitable for the collection of the amateur; and, where we can, endeavour to indicate their points of excellence according to the opinions of the best authorities. The first that we shall treat of are the Hamburgh fowls, which all partake of one common type, and which are remarkable for the beauty and purity of their distinct races. They are very fertile in producing eggs; are of moderate size; excellent table birds, but are non-setters. There are said to be thirteen points in a Hamburgh; but one of the most successful breeders of this kind of fowl, says—"That he never yet saw a bird possessed of the thirteen points which some of the Lancashire breeders say a good Hamburgh ought to have. In the silver-spangled variety the cock should have large white ear-lobes; a well-formed, compact comb, nicely pointed; breast regularly spangled; back and hackle white; tail white, with perfect spangle at the end of each feather; legs slate-coloured; eye large; carriage erect. The hen should be one mass of spangles—the back spangled as perfectly as the breast; tail white, with spangles at the end; hackle spangled or laced; legs, comb, &c., the same as the cock. The ground-colour of both must be pure white, neither muddy nor splashed. In the Northern and Midland counties, Hamburghs, both gold and silver, are more extensively reared, and more highly prized, than all the other varieties of fowl put together; although their constitution is considered, by many, to be less robust or hardy than that of some other breeds. In the pencilled, the cock should have comb and ear-lobes like those of the spangled; body (of the golden) a rich gold colour, with tail nicely bronzed. The hens pencilled from the hackle to the end of the tail; hackle of a clear gold-colour; comb, eyes, legs, &c., same as cocks."

The points considered necessary by the Lancashire breeders, are thus given in the Rev. W. W. Wingfield's Poultry book:—

Comb.—Best double; best square; best piked behind.
Ears.—Largest and whitest.
Neck.—Streaked with green black in middle of feather, fringed with gold at the edges.
Breast.—Largest moons; brightest green black, free from being tipped with white or red at the end of the moon; clear red from moon to bottom colour.
Back.—Ditto, ditto, ditto, ditto.
Rump.—Ditto, ditto, ditto, ditto.
Wing.—Four points:—1st, bow: bright green, black, and clear red. 2nd, bars: two distinct bars, formed by largest, clearest, brightest, green

black moons; bright red from moon to bottom colour. 3rd, flight: clear red. 4th, the lacing or top of the wing above the flight: large, clear, bright, green black spots on the end of the feathers; clear red from spot to bottom colour.

Tail.—Bright dark-green black; full feathered.

Legs.—Clear blue.

General appearance.—Best feathered hen.

For a considerable time our knowledge respecting the different varieties of Hamburgh fowls was both imperfect and confused. Mr. Hallam, however, in his *Illustrations*, published at Birmingham, has done much to diffuse more correct ideas on this species of fowl; and as he is regarded as high authority on this subject, we acknowledge our obligations to him for the following observations:—"Nothing, probably, has occasioned greater perplexity to the poultry fancier, or interposed more frequent obstacles to the satisfactory prosecution of his plans, than the multiplicity of synonyms by which the several varieties of Hamburgh fowls have been long known in different parts of the country. For a considerable time there appeared to be no help for him; and any efforts to identify one or other class, under the changing and arbitrary designations applied to them, were little less arduous than the attempts to determine who was 'Junius,' or 'the Man with the Iron Mask.' If he had any faith in books, he would naturally enough resort to some of the published treatises on the subject of domesticated birds, which, however, instead of extricating him from his difficulties, only 'darkened counsel by words without knowledge,' and rather added to, than lessened his embarrassments. The path of knowledge, proverbially rugged and toilsome, was, in this instance, beset with accumulated discouragements; and instead of receiving assistance, he was removed farther than ever from the attainment of his wishes, by finding, with one exception to be presently noticed, the objects of his search indiscriminately described as 'creoles,' 'pheasants,' 'corals,' 'moonies,' 'moss fowl,' 'Bolton bays,' 'Bolton greys,' 'Dutch fowl,' 'Chitteprats,' 'everlasting layers'—and so on, through a wearying catalogue of local and conflicting terms. To simplify the nomenclature of the Hamburgh fowls, and to apply to each of their specific variations such definitions as would be easily understood and universally recognised, was, therefore, a necessary undertaking; and it may be said to have been satisfactorily accomplished by the principle of classification laid down in the prize list of the great Birmingham Exhibition, which has become an authority in all matters of the kind.

"Of modern English Poultry books, that of Mowbray stands first in the order of time. He speaks of 'the coral, or Bolton greys,' as 'apparently the crack breed of their vicinity, but entirely unknown in the metropolis;' and appends a description of them, by the Rev. Mr. Ashworth, vicar of Tamworth, in the following terms:—'Small sized, short in the leg, and plump in the make. The colour of the genuine kind invariably pure white in the whole lappel of the neck; the body white, thickly spotted with bright black, sometimes running into a grizzle, with one or more black bars at the extremity of the tail: they are chiefly esteemed as very constant layers, though their colour would mark them for good table-fowl.'

"The Hamburghs are now classified in the Birmingham prize list as follows:—

1. Golden Pencilled Hamburgh.
2. Golden Spangled Hamburgh.
3. Silver Pencilled Hamburgh.
4. Silver Spangled Hamburgh.

The use of the terms employed to distinguish what were erroneously called sub-varieties, is entirely discontinued, all the Hamburgh fowls being included in the four classes thus enumerated. It should also be mentioned here, that *all* birds having crests or top-knots, are distinguished in the same list as Poland fowl; an arrangement now universally adopted.

"The Hamburgh fowls, however designated, have been for a considerable time, and still are, held in much estimation in this country, on account of their attractive appearance and great utility. The silver pencilled have met with zealous cultivators in Yorkshire and Lancashire, as 'Chitteprats,' and 'Bolton greys;' 'creoles' and 'corals' are the titles they have received in the South and elsewhere. They are handsome and prolific; though persons who have paid attention to them incline to the opinion that they are somewhat less hardy than the others. But when the situation and other circumstances in which each is placed are

exactly alike, such an impression may, after all, be more fanciful than real. Single combs may occasionally, at rare intervals, be met with amongst them; but when they are of pure blood, no variety of our domestic poultry transmits their own characteristics to their offspring with greater constancy. They are, at present, more frequently met with than the gold pencilled, to which they must yield the palm, so far as mere beauty of colour is concerned. In this respect the latter are not surpassed by any of the inmates of our poultry yards. The cock, with the rich metallic lustre of his sickle feathers, and the glowing hues of the rest of his plumage, is a peculiarly handsome and brilliant-looking bird. There is no difference between the two, except as to the ground or foundation-colour, which in one is golden, and in the other silvery white.

"Mr. Edward Lowe, of Comberford, near Tamworth, had a pair of the gold pencilled, which formed part of the pen which gained the first prize and silver medal for a cock and three hens, at one of the Birmingham Exhibitions. They were never shown elsewhere. This gentleman, who has been a very successful cultivator of the variety, gives the following results of his experience of them:—'I find that a hen, now twelve months old, which has laid about five eggs each week since Christmas, weighs exactly three pounds six ounces; and a cock bird, ten months old, weighs three pounds five ounces. If in good condition, and at full maturity, the cock should weigh at least four pounds, and the hens three-and-a-half pounds each. I have had them at these weights soon after moulting, and before the hens commence laying; but I find them produce such an excessive number of eggs, that they always feel lighter in hand compared with their apparent bulk, and no amount of food which they are able to take seems sufficient to keep up their flesh. I have never been able to ascertain the *exact* number of eggs that one hen will lay in a year, but I know that some of them have produced more than two hundred. Under very favourable circumstances, a single hen might produce at least two hundred and fifty; but I should say about one hundred and seventy would be the average for any given number of fowls. True-bred Hamburghs never show any inclination to sit; and this, which is considered by many one of their best qualities, might prove a serious difficulty to many poultry-keepers who are not able to keep another sort of hens as incubators. I keep a good many game fowls, and the two sorts work well together, though, of course, I am obliged to have them on separate walks, as the Hamburghs are very timid, shy fowls, and easily distressed. When the chickens are produced healthy and right, I always find them endure quite as much hardship as any other. For ornamental as well as useful purposes, the pencilled Hamburgh fowls are certainly unrivalled; and I decidedly give the preference to the golden variety, because they do not show the dirt in a wet season so much as the silver. Their plumage is equalled by none, and their symmetry and qualities of flesh are only surpassed by the game fowls; and they are the greatest producers of eggs of any breed we have."

In the formation of an estimate as to the relative value of particular breeds of fowls, it is important to consider not only the number of eggs which the hens will lay in a given period, but also the proportions in which they are likely to be produced at particular seasons. As chickens, the silver spangled are vivacious, hardy, thriving little creatures. They are thickly clothed with dark-grey down, presenting a mottled appearance; and it is not until they are nearly full-grown that the true character of their feathering is clearly manifest. The cocks are not unfrequently black-breasted, a peculiarity occasioned by the increased size of the spangles, and from the overlapping of the feathers concealing the white portions of them from view. Many persons do not object to breed from a bird of this description, and some of the very best chickens, both cockerels and pullets, have emanated from such parentage. According, however, to exhibition requirements, the breast of the cock must be marked in the same manner as that of the hen, or they will be deficient in an essential qualification. In some localities the taste runs in favour of a black breast; but, according to accredited standards of judgment, it is founded in error, and will not hold good. Their qualifications for the table are also very considerable; for although they are inferior to some other varieties as regards bulk, for firm plumpness they are unsurpassed.

"Silver-Spangled Hamburgh.—*Male.*—Head of moderate size; eyes large and full; beak strong, pointed at the end, and slate-coloured; wattles large, and of a rich bright, transparent crimson, hanging freely. Comb large and double, but not overhanging the head; the points should be sharp, thickly set together, and not open or cupped; it should rise a little in the centre, narrowing behind, and terminating in a point; it should hang loosely, and move as the bird moves. The comb of the cock is much larger than that of the hen; but it should, nevertheless, be remarkably neat, and really ornamental, and not have the appearance of a heavy and unnecessary excrescence. The ear-lobes should be large and well-defined, of a creamy white, and appear as if they were raised from the cheek The neck and tail hackles should be a pure white, and full and long, covering together nearly the whole of the upper part of the body; but not too thick on the neck. The cock should be clearly spangled on the breast and on the lower part of the body; and the wings should also be marked with rows of spangles, and distinctly laced on the edges; the lacing being bold and unbroken—this forming a very important property. The sickle, and other principal feathers of the tail, should be pencilled in the centre of each feather, one half being black, and the other half perfectly white. The other tail-feathers should be of a rich blue black; the tail should also be full and well spread. The legs should be strong, and slate-coloured; a white or yellow leg would disqualify a pen of otherwise good birds. An average-sized bird, at his full growth, will weigh from four-and-a-half to six pounds, which some fine specimens may be found to exceed.

"*Female.*—Head small, and snake-like; eyes bright, lively, and surrounded by a peculiar dark rim. Comb double, of moderate size, and upright; but so loose as to follow every movement of the bird, without hanging over the front or side of the head; the back part of the comb should terminate in a point; the projections on its upper surface should be small, sharp, and placed at equal distances; and its colour a bright transparent red. Ear-lobes white, and of good size. The neck feathers distinctly pencilled with black along the centre; each one of these markings extending, in width, to one-half the surface of the feather. The breast and the whole of the body of the hen, with the exception of the neck, should be clearly and distinctly spangled; the wings being also marked with rows of spangles, and regularly barred with straight lines or 'lacings' along the edges of the large coverts; the lesser coverts are laced round the edge. The principal tail-feathers margined with black, and perfectly clear and free from 'mottle,' or stain; the legs a clear slate-colour; tail spread out and elevated; and the carriage and general appearance of the bird should convey the impression of great vivacity. The ground-colour of the body throughout must be pure white, and the markings, whether 'pencilled' or 'mooned,' an intense glossy black. An average-sized hen will weigh from three-and-a-half to five pounds."

The following is the basis, which is given by a "Dublin Amateur," of great experience, for judging these fowls:—

The Cock.

Head.—Surmounted with full, globular, floating crest, pure white, each feather pointed with black.—The comb rudimentary, or in two small *spicula*; the smaller the better.—The beard full and black, or pure white pointed with black.

Hackles.—Pure silvery white, each feather clearly tipped with black.

Breast.—The largest moons best defined black, most free from being tipped with white at the end of the moon; best and purest white ground-colour.

Back.—The largest and most distinct black edging, according to the size of the feather, on purest white ground.

Saddle.—Ditto.

Wing.—Divided into four parts:—1st, The shoulder: the best and purest white, with largest and most distinct black moons. 2nd, The bars: to have two distinct bars crossing the wing, composed of the largest, clearest, brightest, and best black lacing on purest white. 3rd, The flight: the cleanest and purest white. 4th, The secondary flight feathers: the clearest, best, and most distinct black lacing, on purest white ground.

Tail.—The fullest and purest white, most free from mossing, and most distinctly laced with purest black.

Legs.—The clearest and best blue.

The Hen.

Identical in markings with the cock, except the head; the crest most globular, largest and purest white, with best and largest moons at the end of the feather.

Golden.

Descriptive points of both cock and hen the same

as in the silver, the difference being only in the ground-colour variety.

THE DORKING.

Dorking fowls, comprising the Surrey, Sussex, and Old Kent fowls, attain to a heavy weight, produce eggs of considerable size, and are very superior table-birds. They derive their name from a town in Surrey, where they are bred and fattened in large numbers. Their leading characteristic is an additional toe on each foot. Their varieties, in which the fifth toe is absent, are known as the Sussex or Surrey—heavy, short, square, and plump fowls. Good hens weigh from seven to nine pounds, and cocks even heavier. They stand low on their legs; are wide in the breast, with plenty of white and well-flavoured flesh. The hens are generally good layers; and their eggs, smaller than those of Spanish, and larger than those of Polish fowls, are white and well-flavoured. In point of colour, there are pure white Dorkings, mostly somewhat smaller than the tinted birds. These, it is generally understood, require to be furnished with a double comb. Of the darker hues, there is a great variety; some are speckled birds, with white pea-like spots upon a rich brown ground; and the cuckoo Dorkings, banded with grey and white, are both very handsome and very highly esteemed. For coloured birds, either a single or double comb is admissible, though many fanciers of experience prefer the former. In the Birmingham Prize Lists, all the coloured Dorkings have been classed together, without distinction of comb; but single and rose-combed birds are equally eligible. All the Dorkings are good incubators, though their heaviness and their extra member render them somewhat clumsy nurses.

A breeder at Dorking furnishes the following information in reference to these useful fowls:—

The Qualities of the Bird.—There can be no dispute as to the size to which the white Dorking will grow, compared with the coloured birds; but, since the commencement of the poultry shows, there has been added, I should think, about 3lbs. to their weight; and doubtless, with care, even this may be increased (if necessary), though I certainly think a fowl of five, six, or seven pounds' weight is quite sufficient for the table—in fact, the perfection of size. I have been testing several different breeds of fowls; and I think I can say, perfectly free from all prejudice, that no one will compare with a white Dorking at five months old—it is the very model of a perfect table-bird.

Their Laying Qualities.—They do not, as a rule, by any means enter into competition with the Polands, Hamburghs, or Cochins, as layers; though, during the season, they will lay a great many eggs, and these of a large size, and very delicate in flavour. By rearing early birds, eggs may be procured in winter, as the pullets generally commence laying in November.

As Sitters and Mothers.—In this department they certainly are unequalled, with the exception, of course, of the coloured birds. They sit remarkably close; are very courageous in the protection of their young; good foragers; and, what is a very great advantage, remain a long while with their chickens before turning them off.

Mode of Rearing, &c.—There is a prevalent idea that they are delicate; but certainly my experience will not indorse such an assertion. Last year I reared very few; but the year before, the results were these—seventy-three chickens hatched; one of these had to be cut out of the shell, and, wonderful as it may appear, every chicken was reared with the exception of this one, which was killed by the hen treading on it: so much for the delicacy of these birds. Of course, this was under as favourable circumstances as could be; that is, they were well and judiciously fed, kept scrupulously clean, and had a run on what is, perhaps, one of the most beautiful commons in England—I allude to the one called "The Holmwood," and which almost adjoins the town of Dorking. For the benefit of the mere novice, I will now explain our mode of feeding, &c.:—Let the chickens be undisturbed under the hen twenty-four hours after hatching, only taking care occasionally to remove the loose shells; after this time, place the hen under a coop, and feed the chickens with equal parts of hard-boiled egg and stale bread crumbs, well chopped up together; let the next meal consist of ground oats, mixed with either milk or water into a stiff crumbly mass; this to be followed by chicken groats. Let the chickens be fed every hour, varying the meals as above: at the expiration of a fortnight, a little crushed barley may be added; and, at the end of a month or six weeks, they may be allowed to run and fare as the older fowls—supposing, of course, that you feed all your poultry liberally, and with various foods. Pursue this plan; and when you see a hundred beautiful white fowls roaming over some green lawn or fields, I think you will have no cause for regret that you have chosen for your favourites a breed that can be equalled by none for its useful qualities, and is surpassed by few in beauty.

Till the Cochin-Chinas came into fashion, the Dorkings—whose proprietor had utility in view—held the highest place in all poultry-yards. The abundance with which they supply the London markets, both as capons and chickens, is incalculable; and the breed, notwithstanding the excessive favour shown towards its modern rivals, still preserves, in the estimation of buyers, a very forward place.

In Mr. Dixon's *Ornamental and Domestic Poultry*, we find the following remarks upon this kind of fowl:—"For those who wish to stock their poultry-yards with fowls of the most desirable shape and size, clothed in rich and variegated plumage, and, not expecting perfection, are willing to overlook one or two other points, the speckled Dorkings are the breed to be at once selected. The hens, in addition to their gay colours, have a large flat comb, which, when they are in high health, adds very much to their brilliant appearance, particularly if seen in bright sunshine. The cocks are magnificent. The most gorgeous hues are frequently lavished upon them, which their great size and peculiarly square-built form display to the best advantage. The breeder and the farmer's wife behold with delight their short legs, their broad breast, the small proportion of offal, and the large quantity of good profitable flesh. When fattened and served at table, the master and mistress of the feast are satisfied. The cockerels may be brought to considerable weights, and the flavour and appearance of their meat are inferior to none. Those epicures who now and then like a fowl killed by dislocation of the neck without bleeding (the more humane way), will find that this variety affords a tender and high-flavoured dish.

"Dorkings are better adapted than any other fowl, except the Malay, to hatch superabundant turkey's eggs. Their size and bulk enable them to afford warmth and shelter to the turkey-poults for a long period. For the same reason, spare goose's eggs may be intrusted to them. But, with all these merits, they are not found to be a profitable stock, if kept thorough-bred and unmixed. Their powers seem to fail at an early age. They are also apt to pine away and die just at the point of reaching maturity. When the pullet ought to begin to lay, and the cockerel to crow and start his tail-feathers, the comb, instead of enlarging and becoming coral red, shrinks and turns to a sickly pink, or even to a leaden hue; and the bird, however well fed and warmly housed, dies a wasted mass of mere feathers, skin, and bone."

As a remedy for the above-mentioned weakness, a fresh, well-selected cock-bird or two should be introduced into the walk, every second or third year at farthest. With such precaution carefully attended to, the race will generally be much improved. The arrangement is the best that can be devised; but the necessity for adopting it shows that the cocks of this breed are deficient in vigour.

A high authority gives us the following description as a basis for judging the grey Dorking:—

THE COCK.

Body.—Long and square; the back and belly, breast and behind, forming nearly parallel lines.
Head.—Comb erect, single, rather low than high, serrated, free from cleft behind or side sprigs; waxy eyes orange-red; cheeks crimson-red; ear-lobe small, whitish; wattles turgid, rounded, not pendulous.
Neck.—Hackles bright straw colour, either perfectly free from markings, or having the mid-rib black, and webs straw colour; if marked, markings must be distinct.
Back.—Same colour and same markings as hackles.
Saddle.—Ditto.
Wing.—Shoulder clear straw colour, crossed with a broad, rich coloured steel blue bar; flight feathers white, having the secondaries spangled or partly laced with black on the inner web.
Breast.—Largest, clearest, and best black, least splashed with white.
Tail.—Very full, black, well carried, shot with iridescent colours.
Legs.—White, shorter in proportion than other breeds.
Feet.—Five-toed; the articulation of the hind and rudimentary toe to be perfectly defined.

THE HEN.

Head.—Comb, when in high condition, falling to one side, serrated, free from cleft behind or side sprigs; waxy eyes orange-red; cheeks crimson; ear-lobe whitish; wattles rounded.
Neck.—Hackles, mid-rib black; edges silvery white, well defined.
Back.—Shaft white; webs minutely dotted with black on whitish ground, presenting a grey appearance.
Saddle.—Same.
Wing.—Shoulder same grey as back; shafts broad, and very distinct straw colour; flight, dark brown.
Breast.—Reddish fawn colour.
Tail.—Full rich brown, with minute black markings; edges approaching silvery.
Legs and Feet.—White; toes, five in number; articulations clearly defined.

DORKING (WHITE).

Head.—Comb single or double; if the former, subject to the same rules as the grey Dorking; if double, the duplicature to be distinct.
Body.—Clear white.
Tail.—Full and well carried.
Legs.—Five-toed; articulation of toes well defined.

DORKING (PHEASANT AND SPECKLED).

Of doubtful purity; no markings to be relied on.

THE GAME FOWL.

The *Game Fowl* is, in the estimation of many, one of the most beautiful of birds. His flesh is excellent; whilst the hen is a fair producer of eggs, a good sitter, and attentive mother. Both male and female, however, are very troublesome, from the extraordinary combative qualities with which they are endowed. The cock has long been known for his fighting propensities; and mankind having early discovered this, made them administer pleasure to their own destructive tendencies. "Cock-fighting is indeed so old," says an article in the *Sporting Dictionary*, "that we hardly know whence to derive its origin. Asia, however, has the credit of first fostering it; and it seems to have been cultivated by the natives amongst their earliest games. The first records of China note it. In Persia, it was early encouraged, in conjunction with hawking and quail-fighting; nor was it to be wondered at, that, as man became belligerent, he would, in order to extend his conquests, commence his education by observing the offensive and defensive operations of animals, thereby the better to regulate his own. When Themistocles was engaged in warfare with the Persians, he was struck with admiration at the bravery and determination displayed in the battles between the cocks of that people; which was such as to occasion him to exclaim to his admiring army, 'Behold! these do not fight for their household gods, for the monuments of their ancestors, nor for glory, nor for liberty, nor for the safety of their children, but only the one will not give way unto the other.' This so encouraged the Grecians, that they fought gallantly, and obtained the victory over the Persians; upon which, cock-fighting was, by a particular law, ordained to be annually practised by the Athenians. The inhabitants of Delos were great lovers of the sport; and Lanagra, a city of Bœotia, the Isle of Rhodes, Chalcis and Eubœa, and the country of Media, were famous for their generous and magnanimous race of chickens. It also appears that they had some peculiar method of preparing the birds for battle. Cock-fighting was an institution, partly political, at Athens, and was continued there for the purpose of cultivating the seeds of valour in the minds of youth. But it was afterwards perverted and abused, both there and in other parts of Greece, till it became a common pastime and amusement, without any moral, political, or religious intention, as it was, until lately, followed amongst us."

In his form and aspect, and in the extraordinary courage which characterises his natural disposition, the game fowl exhibits all that either the naturalist or the sportsman recognises as the *beau-ideal of high blood.*

He is somewhat inferior in size to other breeds; but his shape, approximates more closely to the elegance and lightness usually characteristic of a pure and uncontaminated race. Amongst poultry, he is what the Arabian is amongst horses, the high-bred short-horn amongst cattle, and the fleet greyhound amongst the canine race. Such being the character of this variety of fowl, it would doubtless be much more extensively cultivated than it is, were it not for the difficulty attending the rearing of the young; their pugnacity being such, that a brood is scarcely feathered before at least one-half is either killed or blinded by fighting. Their elegance of form, and brilliancy of colour, however, render the breed objects of great admiration. They are of all colours; and each variety seems to have had its patrons, the rule being to mate the cock with hens of the same feather, or "rightly plumed to the cock," as Spetchly has it. Deviations from this rule are frequent, as we find the same to be the case in all kinds of animals which have been reduced to a state of domestication.

When a cock is selected, he should be placed with from four to six hens, bringing them together in November or December. If he be young, the hens may be full-grown; if two years' old, then the hens may be young pullets, in the case of a strong breed being desired. Mark attentively how he bears himself to all his hens, as it frequently happens that one or other of them falls under his displeasure, in which case she should be removed. Choose the best-shaped eggs, and neither the earliest nor the last laid; and, to avoid mistakes, mark them, and place them under an old game hen—the old being excellent mothers. Their place for sitting should be private, and free from all annoyance or intrusion.

When hatched, the young should be regularly and often fed, in small quantities at a

time, after the first day or two. Their food should be :—

Macerated eggs boiled hard.
Crumbs of white bread
Lettuce-leaves and meadow ants.
Maggots from grains.
Steeped oats and small wheat.
Curds, with new milk.
Bread, toasted, and steeped in chamber-ley.

The varieties of game fowl bred in this kingdom are very numerous, and, to the uninitiated, their designations very unintelligible. For the purposes of combat, the black-breasted reds have been the favoured variety. The recognised breeds are, according to Spetchly :—

1. Black reds.
2. Silver black-breasted ducks.
3. Birchen ducks.
4. Dark grey
5. Mealey greys.
6. Blacks.
7. Spangles.
8. Furnesses.
9. Polecats.
10. Cuckoos.
11. Gingers.
12. Red duns.
13. Duns.
14. Smoky duns.

"In all these," says Spetchly, "good birds may be found. From them, however, have been raised crosses innumerable; and it is the aim of the fine breeders of the present day, to have their birds as much as possible uniform in feather, blood, and constitution."

The best month for hatching game chickens is March, as it has been generally found, that when hatched in this month, they prove to be the most hardy birds. We should state, however, that whatever may be their beauty and high courage, game fowl will be very troublesome in a poultry-yard of various breeds, especially if another chanticleer is kept; for although their smaller size might lead to the supposition that they will not be the aggressors, this is a mistake. Their indomitable spirit forces them to quarrel with every other bird; and their activity and strength render them dangerous to the heaviest adversary.

THE SPANISH FOWL.

The *Spanish fowl* is one of the largest breeds; a productive layer of full-sized eggs; and, in the great majority of cases, a non-sitter. Its plumage is black; and it is a little smaller in size than the old "shakebag;" but in every other quality, in which excellence is to be expected, it surpasses that bird. The back of the Spanish fowl is tinted with a glancing green; whilst the feathers of the legs, thighs, and belly are particularly decided in the hue, and of a *velvety* aspect. In its carriage it is stately, having a grave and majestic deportment, such as might be supposed to become the monarch of the poultry-yard. When in condition, he is not only a beautiful, but a useful bird, with white cheeks, and large comb and wattles, very highly coloured. The legs are of a leaden colour, and so are the feet, except the soles, which are of a dirty fleshy hue. A full-grown cock weighs about seven-and-a-half pounds; the hen about six-and-a-half.

These fowls have long been established in Great Britain and Ireland; and exhibit no constitutional peculiarities which suggest difficulties in either hatching or rearing. As table-birds, they hold a place in the very first rank, their flesh being particularly tender and juicy; whilst the *skin* possesses that beautifully clear white hue, so essential in birds designed to be consumed by the gourmand. The hens are the highest class of layers; and of all the naturalised and indigenous varieties of fowl, they, with other sub-races of the same type, produce the Andalusians and Columbians, being the largest and best-flavoured eggs. Besides, they are prolific, and extremely easy to feed. Spurious specimens of this fowl are often in the market; consequently, a buyer should know all the points of a fine bird before he enters the market. To purchase a spurious fowl will cost as much as the other; will be as expensive to feed, but will *not* bring an equal *return* in the way of profit. By applying, in the first instance, to a breeder of known respectability, much disappointment will be avoided; and though the price demanded may appear high, it may not, perhaps, be higher than what would have been paid for a bad article. Even should a few shillings extra have to be laid out, it is better to do so willingly, as, in the long run, it will be found the most prudent plan. It may here be observed, that the addresses of the leading amateurs and dealers in poultry, may be learned by consulting the catalogues of the principal shows throughout the country.

Spanish fowls have occasionally changed their plumage, and become perfectly white.

A person writing to a sporting paper, says that he has seen a perfectly white Spanish hen which had once been entirely black; and inquires if such a thing is not very uncommon, and if any of his readers can account for such change; it had not the plea of cold, like the ptarmigan and mountain hare. We have heard of several instances of a black Spanish fowl becoming a white bird; and recollect one exhibited at a poultry show as a white Spanish fowl, which we were told had undergone this curious change.

In forming a judgment of the excellences of the Spanish fowl, the following are the points to be looked at:—

THE COCK.

Head.—Comb erect, serrated, surface waxy, free from side sprigs or warts; not too high; face pure opaque white, as well over the eye as the cheek, separated from the comb by a distinct line of black feathers; ear-lobe pure white, free from pink or blue tints, and very large, meeting under the wattles; eyes orange; beak blackish horn colour; wattles long and pendulous; all the body black, brilliantly glossed; legs black.

THE HEN.

To match; distinctive marks the same, except in the comb, which should fall over on one side.

THE POLISH FOWL.

Polish fowls have a top-knot of feathers instead of a fleshy comb. They are generally non-sitters; lay medium-sized eggs; are of middle weights, and great favourites with the epicure. Why these birds are called Polish, or Poland, we are unable to say, as there is no evidence of which we are aware, to show that they originally were imported from Poland. They are birds which frequently exhibit great courage, whilst their beauty is unquestionably very considerable, although that property has, in one point at least, formed a subject of dispute. This point is the beard; but the best way of determining the merits of this appendage of the head, is by making both bearded and unbearded specimens equally eligible to prizes. There is now only *one* class for bearded or unbearded Polish of each colour—the same applying, in this case, as in Dorkings.

The impression, however, is, with many, that the ruffs, or beards, should be taken as *one* point in *favour* of the birds which are adorned with that appendage. Mr. Wright's opinion is, that the bearded fowl will, in every case, be found to be the best in all respects. It is quite true, that while the unbearded varieties have greater delicacy of form and plumage, the bearded are endowed with considerably more constitutional vigour.

"The favourite varieties of Polish fowls, are the Black, with white crests; the Golden Spangled, and the Silver Spangled. The Golden Spangled is of no ordinary beauty; it is well and very neatly made; has a good body, and no very great offal. On the crest, immediately above the beak, are two small fleshy horns, resembling, to some extent, an abortive comb. The wattles are small; the hackles on the neck are of a brilliant orange, or golden yellow; and the general ground-colour of the body is of the same hue, but somewhat darker. The thighs are of a dark brown, or blackish shade, and the legs and feet are of a bluish grey. The full-grown cock weighs about six pounds, and the hen five-and-a-half pounds; the eggs moderate in size, and very abundant. In the Silver Spangled varieties, the principal difference is, that the ground-colour is a silvery white. But the spangles themselves have been the subject of serious feud; and the Birmingham list now discreetly contents itself with calling them Golden and Silver Poland; which it has the greater right to do, inasmuch as the degree of disposition of the markings is not so rigidly laid down for Polish as for Hamburgh fowls. Besides these, there are pure white Polands, entire dun-coloured Polands, and other combinations of hues. A much-desired variety—white, with black top-knot—like the common cuckoo, 'tuneful bird, seldom seen, but often heard' of—is to be met with in every Poultry-book, and would make the fortune of any one who could produce a pair or two alive."

In England, these fowls are esteemed rather a fancier's than a farmer's stock. Their non-sitting disqualification renders them unsuitable for agricultural purposes; but their flesh is of the very highest excellence. They are reared in Egypt, in immense numbers, the practice of artificial hatching supplying the constitutional defect of the birds. A vast number of Polish fowls are bred in the department of Calvados, in France, especially in the neighbourhood of Caen, whence they are brought to Le Havre by various conveyances, for the supply both of the town and the shipping. No care is taken

to keep the breeds pure, and they are found with or without beards, as the case may be. A warmer and drier climate than that of Great Britain seems to be more congenial to the Polish fowl. The chickens are very slow in growing, and it is difficult to distinguish the sexes at an early period of their life. Still they are exceedingly pretty objects, as they carry their little downy top-knots on the very day of their entrance into existence.

In reference to this fowl, one, who seems to have studied its nature and qualities, says, that in judging of the points of this kind of fowl, he would suggest the following as a good basis to go upon :—

FOWLS WITH CRESTS.

Improperly called Poland or Polish; no record to be found of fowl so named.

WHITE-CRESTED BLACK.

THE COCK.

Head.—Surmounted with a globular, floating crest, in two parts; smallest amount of black on forehead, and fullest and clearest white falling equally on all sides.—The comb rudimentary, in two small spicula.—The ears fullest and clearest white.—The beak, horn colour.—Wattles full.
Neck.—Best brilliant shining black, free from white or any other colour.
Body.—Ditto.
Wings.—Ditto.
Tail.—Ditto.
Legs.—Blackish grey.

THE HEN.

Similar in all respects to the cock, the crest appearing more globular on account of a difference of shape of feather.

BLACK-CRESTED WHITE.

The reverse of the foregoing, believed to be extinct; the greatest desideratum of the poultry fancy.

CRESTED WHITE FOWL.

Description as to form of crest the same; the colour best and purest white.

The Sultan fowl, or Serai Tä-ook, is, by some, supposed to belong to the Poland species.

"In fulfilment of a promise of long standing, to Mr. Tegetmeir," says an intelligent writer, "to send him the first Sultan fowl which should die, for the purpose of ascertaining whether these fowls are possessed of the peculiar conformation of head of the Polands, I lately sent a hen for *post-mortem* examination; and he stated, 'the structure is of that very remarkable kind, found in the Polands.' When the young chickens are hatched, the embryo crest shows itself as in the chickens of other Polands; and, in all their habits, they pronounce themselves of that variety. So much for their kind.

"The Sultan is a short-legged, plump, compact fowl of medium size. The tuft on the head is large, compact and globular; it has a muff, whiskers, and gravel eye. The plumage is abundant, and of a pure white. The legs are well booted and vulture-hocked; there are five toes on each foot. It is a brisk, active fowl, and exceedingly ornamental.

"In their own country, Turkey, they are known by the name Serai of Tä-ook; literally translated, 'Sultan's Palace Fowls,' or 'Fowls of the Sultan's Palace.' The first fowls resembling the kinds which attracted my notice, were Dr. Burney's Ptarmigans; but they were very inferior to those imported in 1854 (which, with their progeny, have taken so many prizes since that time), being very poor in the crest, less compact in form, unmuffed, and without the fifth toe. But, like the handsomer Sultans, they were good layers of large eggs, and non-sitters."

COCHIN-CHINA FOWLS.

The Cochin-China fowl is of great weight; very prolific of eggs and young; a good incubator, but not of a decidedly good quality for the table.

This species of fowl, on its appearance amongst us, produced a perfect mania in the poultry world; and we are principally indebted to her Majesty and the late Prince Albert (who, in April, 1846, sent two fine specimens to the cattle-show of the Royal Dublin Society) for having first made them known to our poultry-yard.

Since that time the breed has been extensively cultivated; and now, whenever there is a poultry exhibition, the representatives of the celestial empire are sure of having a place. The large prizes awarded for these fowls, and the extraordinary prices they realise at public sales, show the excess to which a passion may be carried. At Kensington, a collection, consisting of a few birds (with their young chickens) which had obtained the prize and the extra medal at the Birmingham Exhibition in

December, was sold at what might well be considered fabulous prices. For a cock, £8 5*s.* was given; and for a hen, £5. The entire sale realised £100. At a sale by auction of Cochin-China fowls, in King-street, Covent Garden, and at another in Deptford, light buff-coloured specimens fetched the highest prices. A pair of chickens, hatched March 6th, the pullet being "fine and light," fetched £3 17*s.*; "a light-coloured cock," hatched in the same month, was sold for £2; "a beautiful light-coloured imported hen, 1851," for six guineas; and another light-coloured hen, and a light-coloured cock, both hatched in 1851, sold for £5 each. Inferior specimens averaged about 10*s.* a head. The Deptford specimens were much too leggy to fetch very high prices. One lot, a light cockerel and pullet, was sold for £3 5*s.* "But what is still more extraordinary," says Mr. Richardson, "we are assured that a gentleman, well known as a breeder near London, lately sold a pair of fowls for thirty guineas, and another for thirty-two guineas. The same person has been offered £20 for a single hen; and has sold numerous eggs at one guinea each. He has also been paid down, twelve guineas the half-dozen for chickens just hatched, to be delivered at a month old. Nay, we are credibly informed that as much as £60 per pair has been given for the pure breed. The collection of Cochin-China fowls formed by Mr. Andrews, of Dorchester, was sold by him to Mr. Catlin, for £250."

The exhibition of the first white Cochin-Chinas, in this country, was at Birmingham, in 1850; and Mr. E. Herbert, of Powick, Worcestershire, was the exhibitor. He had them from the Dean of Worcester, who received them directly from the importer. A price of £5 was placed upon the pair, which was intended to be prohibitory; but they were, notwithstanding, immediately bought; and the buyer was at once offered £7 for them, which he refused. At a subsequent Birmingham show, the same birds were sold for £10; and the prices of the variety have since risen considerably.

The first birds of this breed were brought to the Queen's aviary, and called the "Cochin-China," from their being imported from that country. The breed is also called "Shanghae," from specimens having been early introduced by Mr. S. Moody, of Manchester, from that city. The terms Cochin-China and Shanghae are, therefore, used synonymously. Cochin-China is a country about one-third larger than the British Isles, and ranges from about 9° to 23° north latitude; while Shanghae is one of the most northerly ports with which we trade in the Chinese dominions, being situated in a much higher latitude than Cochin-China. It is quite possible that birds of this kind may have been imported from both parts of China, and have originally sprung from the same stock; or, if different varieties exist, there is certainly some difficulty in discriminating. As commercial intercourse has long been established between the Chinese and the Cochin-Chinese, either country may have imported them from the other. At Shanghae they are known by the term *Loo-Choos*—the name of a group of islands lying off the channel coast. It is also well known, that birds of large size, with feathered legs, and having all the principal features of these birds, have been imported to Adelaide, in Australia, from Singapore. Some years ago, they were in the very southern part of the Malay peninsula.

From these circumstances, we may reasonably infer that the breed has, for some years, been pretty generally distributed over the eastern coast of Asia, and that to establish the precise place of its origin, would be a matter of considerable difficulty. This fact will, to some extent, account for the many spurious specimens, or impure-bred birds, which have been brought to Britain from the southern ports of China, as this is the district of the Malay variety of which we shall by-and-by speak. The birds, therefore, from Shanghae, are, perhaps, of the purest blood. At all events, to separate them into two classes is decidedly a mistake, as no sufficient marks exist to establish a Cochin-China as a distinct bird from a Shanghae.

The author of the *Poultry-Keeper's Calendar*, furnishes us with the following interesting remarks:—"There are, doubtless, many handsome and profitable kinds of poultry, in different parts of the world, which are unknown and unnoticed in England. In Russia, there are some which are so much valued there, that it is almost impossible for strangers to obtain

them; and, in Turkey, the Cochin-Chinas were known and highly prized while still strangers here, having passed into that country by way of Asia. A few years back, while the Cochin-China fowls were yet unknown to me, and after I had met with only disappointment in an endeavour to discover, in the Spanish, the good qualities often attributed to them, I was told of some fowls to be found in Turkey, possessing size and other good qualities in great perfection, and I, of course, became immediately very anxious to buy some of these rare birds. Several of our friends, at that time living in Constantinople, and *their* friends, kindly placed themselves in full pursuit of these wonderful fowls, but without success; and we were, after some time, obliged to give up the idea of having them. At length, one of our Constantinople friends came to London to see the Exhibition, and, on his return, I sent by him a Cochin-China cockerel and two pullets, as a present to his father. During the voyage, many persons from the different ports came on board to see these wonderfully large fowls, with a strange, unearthly crow; and, on the arrival of the ship at Constantinople, it was found that those were the very same fowls which I had been so anxious to obtain from Turkey; which had, however, become very scarce there, and which, if ever sold at all, were only to be purchased at an enormous price.

"About eight years ago, a young sailor, who had served in our family before he went to sea, brought me a fowl from the Cape of Good Hope, of a kind which I have never seen since. He (for it was a cock bird) was entirely jet black, with long scarlet wattles, and a very full rose comb; the shape of his head and neck was Malay-like, and his tail drooping. He was very upright in carriage, and he looked tall, even by the side of a fine Spanish cock. He was certainly very handsome. Of his other qualities I had little opportunity of judging; for very soon after I had him, he and his rival, the Spanish cock, got together and fought, although we had fancied them securely separated, and both ultimately died from the injuries which they then received. I never but once saw a bird like him, and which I have always thought must have been brought over at the same time; for the same sailor had two cocks with him in that voyage. This second bird I saw exhibited at a poultry exhibition in the Zoological Gardens, Regent's Park: he was mated with hens very unlike himself, and the coop was labelled 'Crow Birds.'"

In the essentials of size and power, the Cochin-China fowls excel every other kind of poultry; whilst the softness of their colour is the admiration of many. This generally consists of rich glossy brown, or deep bay, with an occasional mark on the breast, of a blackish colour, and of the shape of a horse-shoe. This mark, however, is not to be taken as an infallible sign of the breed. The comb is of a medium size; sometimes, but not always, slightly serrated; and the wattles are double. The plumage is bright, and has a peculiar softness to the touch; whilst the prevailing and most admired colours are buff, yellow, cinnamon, and grouse.

In exhibiting the Cochin-China fowl, colour, beauty, symmetry, weight, and general excellence are of great importance. Various rules have been laid down for the guidance of amateurs in the purchase of these birds; and having been framed, the following general outline can safely be given:—

1. Moderate length of *legs*, inclining rather to short than long. The legs yellow, or yellowish, in front, with reddish or flesh-coloured sides, and well covered to the toes with feathers. Fowls without feathered legs (that is, "not booted," to use the technical phrase), do not possess one of the essential characteristics of a first-rate bird. The more densely the outside of the leg is feathered, and the nearer in colour the leg feathers are to those of the other parts of the body, the greater the beauty, so far as the booting is concerned.

2. *Head*, rather small and narrow; face red; comb somewhat diminutive, single, and not too deeply serrated; even (*i.e.*, not bent in and out) and upright.

3. *Tail* very short, so as to be almost buried in the rump feathers, especially in the hen. Pure Cochin-China fowls have no "scimitar tail-feathers." Some were exhibited at Lewes, which had these feathers naturally, and were, therefore, disqualified.

4. *Wing* small, the extremities of which should be almost hidden under the breast feathers before, and by the saddle feathers behind.

5. *Body* deep from back to breast; wide on the rump, and very broad behind, which part, as well as the thighs, ought to be covered with downy feathers, in such abundance as to give them a very large appearance. Tail and wing very small; thigh remarkably thick, and the stilt short; dense *fluffness* of the stern and thighs; legs well-feathered, or *booted*, down the outside.

In matters on which there are many opinions, it can never be an injudicious plan to give what are esteemed the best, by those who have a large acquaintance with the subject of which we are treating. Accordingly, from others which we will presently give, we select the following for insertion here, as being from an amateur of great experience:—

"The cock bird is of a dark-red colour, with a dark hackle, edged with yellow; very fluffy about the thighs; each fluffy feather presents a very peculiar characteristic—viz., being semi-double, or as if it had been split from the apex to the base (I have never found the feathers thus in half-bred birds); the wings very short, and doubled under; comb single serrated, but not deeply so; legs short, flesh-coloured in front, pink down the sides, and somewhat feathered; a *few* sword feathers in the tail; the crow generally ending in a prolonged kind of roar: weight about 10 lbs. Hens partridge-coloured; lay abundantly, very dark, middle-sized eggs; weight about 7 lbs. or 8 lbs. each. Chickens feather slowly; cockerels even more so than pullets. When about three months old, cocks weigh 4½ lbs.; hens, 3 lbs. to 3½ lbs. each: roost on the ground at night; all of a quiet disposition, seldom or never fighting. Hens excellent sitters and kind nurses."

The remarks of Mr. Trotter, of Henley Mill, near Hexham—written in further illustration of the *Essay* for which the Royal Agricultural Society, in 1851, awarded him a prize—merit notice here. They are valuable, as coming from a gentleman of great practical experience, who carried off several prizes at the Northumberland and Durham Society's show, for the best Cochins, Dorkings, Spanish, and Pencilled Hamburghs.

"Beneath the vent," he says, "there is a much greater abundance of 'fluffy' feathers than in other varieties of fowls. The feathers on the thighs also partake greatly of this fluffy nature. The outside of the legs, and the outside toe, ought to be profusely covered with feathers. The wings are so short as almost to deprive the birds of flight; in fact, it is with difficulty they can mount a balk two feet high; it is therefore necessary to have the balks where these fowls are kept, even *lower* than I have already recommended. These fowls having great length, breadth, and depth, attain to almost incredible weights, averaging about 11 lbs., if good specimens. The hen weighs seven, eight, nine, or even sometimes as high as 10 lbs.; but as some commence to lay much earlier than others, a greater difference prevails in their weights than in those of the cocks.

"The most esteemed colour of these fowls is ginger; but as there are *pure* bred birds of almost all colours, including black and white, I am in favour of selecting them as much by their shapes as by their colour. No judge of 'short-horns' would, when acting in that capacity, give preference to an animal of 'fine roan,' the shape of which was less perfect than one of a less admired colour—such as red or white—providing the character of purity were evident. Neither do I think any judge of fowls ought to give advantage to any Cochins on account of colour, if the shapes are less perfect than others of less admired colours. The colour of the legs varies in different specimens; but a 'pinky' is most admired. Their eggs mostly partake of a chocolate colour, but differ very much in deepness of hue; some approaching almost to pink, while others are only a few shades removed from white."

As a basis for forming a judgment, the following points are given by a Dublin amateur:—

THE COCK.

Head.—The beak, in the lighter varieties, yellow; in the darker, horn colour.—Eyes pearl, or orange red.—Comb low, single, serrated, free from sprigs, and smooth.—The wattles full and round.—Earlobe very full, falling to a level with the wattles.—Face brilliant crimson.

Neck.—Orange, varying in tint according to variety.

Back.—In the light-coloured varieties, orange; in the dark, orange marone.

Wing.—Shoulder, and throughout, graduated tints of orange yellow in the light colours; in the dark, orange marone; flight feathers bay.

Breast.—In light colours, buff; in partridge-coloured, brown, with dark markings, sometimes pheasanted; in grouse-feathered, black breasted.

Tail.—Black, scanty, and drooping.
Legs.—Feathered to the toes; yellow; the skin, in the dark varieties, inclining to red at the back. In the lighter varieties, pale yellow, free from blotches of dark colour.
Thighs.—Fully covered with long loose feathers.

THE HEN.

Head.—Small; comb single; eyes pale orange, or pearl colour; wattles same as cock, but smaller in proportion.
Neck.—Graceful; small at the insertion of the head. In the lighter varieties, the hackles graduated tints of pale orange buff; the lower feathers brown in middle, outside webs orange. In the lemon colour, free from marking. In the partridge, mid-feather brown, edge golden.
Back.—In the lighter varieties, gradations of yellowish buff, according to class. In the partridge, brown, with yellow shaft and light edge. In the grouse, a darker brown.
Saddle.—Ditto; feathers very long and loose, almost obscuring the tail.
Tail.—Brown.
Legs.—Yellow; well feathered to the feet, according with body colour.
Thighs.—Very full-feathered; webs long and disunited.

Of the gentle disposition of the Cochin fowl, much has been said; for it seems quite averse to any display of pugnacity; whilst it may, with safety, be inclosed within a fence of not more than three feet high. From this circumstance, its desire to wander cannot be deemed very great. There are instances where it has been kept in a flower-garden, in a space of about thirty feet long and twelve wide, inclosed by galvanised iron network only three feet high; and it never attempted to get over. The feathers of the wings being short, and well doubled under, or clipped, entirely prevent its flying, or "over-leaping" a fence.

An amiable trait in the character of Cochin fowls, is the tameness which they evince in all their relations with man. Domestication, in their case, seems to be brought to the highest perfection: as they will not only readily feed from the hand, but permit themselves to be handled without betraying the slightest uneasiness. At first sight, however, they do not seem so attractive as other fowls. In this country, we have had, constantly before our eyes, clean-legged poultry, with plenty of tail: it is therefore some time before we become accustomed to this eccentricity; but when the eye has become used to it, there are no finer-looking birds in the poultry-yard than they are—the cock birds weighing from 10 to 12 lbs. each, and the hens from 8 to 9 lbs. In the specimens, the cocks are best—upright fellows, square built, and abundantly feathered on the leg and thigh, with only a bunch for a tail, and a bright crimson saddle. Long golden-reddish feathers fall over each side of the back, just beyond the wings. The hens have a very small tail, and the fullness of the thigh is more marked in them than in the male bird. The crow of the cock birds is not like that given by the common chanticleer, but ends with a note similar to the growl of a dog.

It is not unnatural for the Cochin-China to roost; but their wings are so defective, that they cannot attain any considerable height by flight; and, if enabled to mount up by a ladder, they are apt to maim themselves in leaping down. A bench, with a top, six inches broad, and raised a foot from the ground, with the floor swept out, and fresh sand every morning, is the best roosting-place that can be made for them.

There appear to be several distinct varieties of the Cochin-China race, some of them being square-built, and others resembling the Malay; which are considered the purest breed. The latter throw out the indispensable single comb, before and while laying, and, to a great extent, lose the Malay-like appearance about the head. The white Cochin-Chinas are a splendid variety, of robust shape, and equally hardy with the others. There is also a variety termed the "Lovell breed," which, for fulness of breast, generally surpass all others; but the breed is scarce. A careful and judicious cross between the large Shanghae birds and the Cochin, has been found to improve the progeny in size and constitution; but, for breeding purposes, the shortest-legged Shanghaes must be selected, and those with most of the properties of the Cochins.

A correspondent of the *Cottage Gardener* says, that he succeeded in producing, from a very large imported hen, and a magnificent cock, three or four decided grouse-plumaged pullets; and so definite is the colour, he says, that strangers, one and all, exclaim, "How like the grouse!" They are large, strong upon their legs, and have the usual quiet demeanour of the Cochin. The dark-red and partridge-coloured cockerels, which attain to a considerable bulk, are preferred by some; while others

prefer those of a medium size, deep in the breast, broad across the back, and with short legs. Putting aside all these minor points, however, which are mere matters of taste to the fanciers of these fine birds, we may safely say, that the light-coloured varieties are in general highly prized; while, for strength and weight, the dark birds are superior; but for beauty, the yellows, fawns, and buffs carry off the palm. Red cocks, with hackles of a uniform gold colour, produce a variety of good light birds, especially if with light hens, and thus materially strengthen the stock.

In rearing and keeping these birds, rice, boiled and kept well, and stirred for six minutes, so that the grains are separated one from another, should form a portion of their food. When young, it is particularly grateful to them. In the spring, when the hens are laying, the most suitable food is the best heavy barley, with occasionally a few oats and wheat, and, once a-week, some offal meat, such as sheep's pluck, well cleaned and cut in pieces; sheep's noses, with the hair scalded off; worms, plenty of chickweed, and now and then a cow-cabbage.

When moulting, barley, oats, wheat, Indian corn, and soft meat of barley meal, with the best sharps, mixed rather stiff together—not exactly scalded, but made up with warm water—should be given. Fowls are fond of a variety of food, and like it frequently to be changed; but for staple food, give them the best heavy barley. Put some lettuce-seed into the ground early, and, as soon as fit, transplant in a warm place. Give the fowls plenty of these, as well as cabbage-leaves, as they like most kinds of green meat. To be kept up, they must have their meat constantly by them. It will not do to feed them at stated times, for then they glut themselves, and do not lay so well; whereas, if the food is by them, they take it regularly.

In rearing chickens, much attention must be paid to their food, giving them frequent changes, and tending them with great care. Bread scalded in milk, rice, grits, barley; and, for a change, put some rice into the side-oven with water, leaving it to be scalded only to such an extent as will make it separate or granulate easily; the same with barley; and as soon as the chickens eat well, let them have barley-meal. They should also have, once a-day, some chopped meat, such as beef and mutton; and of chopped green meat, such as lettuce, they will eat abundance.

An eminent writer on poultry states, that he allows three pints per day of grain to twelve fowls, besides a dish of potatoes, and a quart of middlings made into porridge. He also gives them the run of a small orchard a few hours each day.

To attain those heavy weights for which this breed is distinguished, the birds must not only be liberally, but judiciously fed. To the growing chicks, the materials necessary to form bone, as well as flesh and sinew, must be supplied. "At Birmingham, a cockerel, otherwise perfect, was supposed to have suffered some injury or fracture in the legs; but he was only rickety. His frame abounded in all requisites, except phosphate of lime, which, of necessity is a great essential. It should be remembered, that quadrupeds suck in this *building-material* of their skeleton with their mother's milk, which contains it in sufficiency; but that gallinaceous birds, to attain weight and corpulency, must take it *with their food*. Therefore calcined oyster-shells, broken egg-shells, chopped bones, pollard mixed stiff with milk, and such like, should be allowed to be freely eaten *ad libitum*."

The whole of the Cochin-China race are excellent layers—a circumstance which, in an economical point of view, adds greatly to their value. With the exception of a short interval at moulting, they lay the whole year round; and a supply of young pullets would produce eggs even at the time when the old ones cease laying. A hen exhibited by her majesty at a Dublin show, laid ninety-four eggs in 103 days. Pure birds will generally lay from thirty to thirty-five before wanting to sit. The number of Cochin eggs laid at poultry shows, especially when the exhibition is one that happens to be open for several days, and the fowls, therefore, have to be on the spot some time before and after, is surprising. But this may not be a subject of wonder, when it is recollected that most of the birds are in the best possible health and condition. On such occasions, the poor things are sadly puzzled to know what to do with their inconveniently-timed produce; and to see a hen,

after a few moments of uneasiness, carefully roll her *possible* chicken up into one corner of her pen, frequently affords considerable amusement to the looker-on.

As to the fecundity of the China fowl, it is thus testified to, by the Rev. W. W. Winfield. He says—"A remarkable instance of the merits of Cochin-Chinas, as layers, has just come before me. A young Punchard hen was brought home on the 24th of last December. She laid on the 25th, and continued to do so, till, in 96 days, 93 eggs were laid: 10 more eggs were then laid in 20 days—making, in all, 105 eggs in 116 days; she then sat and reared a brood." Mr. F. W. Rust, of Stowmarket, Suffolk, says that he had a hen, which, on two occasions, laid two eggs in one day; the first time on the 16th of April, within three hours, and the last on the 12th of June, within the hour. Captain W. W. Hornby, R.N., of Knowsley Cottage, Prescot, Lancashire, reared pale buff-coloured Cochin-China cockerels of the very first class; and states that one of his hens laid two eggs in one day, but that she did not lay on the following. The eggs of the Cochin-China are not quite so large as those laid by the Malay, and the colour is generally a pale chocolate, or yellowish-white; but some are nearly white. They have a very delicate flavour.

An essential object in the hatching of these birds, is to infuse fresh blood into your stock, by purchasing a fine young cock, or eggs of good breed from some party on whose stock reliance may be placed. As eggs obtained in town are often inferior, try to get them from the country; and, if possible, see the parents. The eggs will carry perfectly safe, if placed in a box, with the large end uppermost, and well bedded in bran—not sawdust, as the turpentine may injuriously affect them.

The usual time of sitting and hatching is from nineteen to twenty-two days; but it may be a day sooner or later. If, however, an unusual delay takes place, it may be attributed to staleness of the eggs, or unsteadiness of the sitter at the commencement of sitting. Sometimes young chicks, from various causes, die in the shell, either from some fault in the parent birds, or the eggs having been stale; from want of warmth or steadiness in the sitter; or from their being put in a situation which is too dry. But the same mischances are likely to occur with other birds. If the eggs are fresh, they do not require a longer time for hatching than those of ordinary fowls; but instances have occurred of a couple of days longer being required for the purpose of incubation. As sitter and nurse, the Cochin-China hen is decidedly superior to the Malay, the length of the limb of which makes her an awkward sitter, whilst it also renders the task irksome to her. The hens should be set early in spring, and not later than the middle of April. But if in March, it allows a chance of mild open weather during April; and the birds will be finer grown in the ensuing autumn than if hatched later. Cochin-China hens are kind and attentive mothers to their young brood, and generally remain with them for a week or ten days after beginning to lay, which is usually one month after hatching.

Mr. Broughton Kingston, of Exeter, a successful breeder of the Cochin fowl, gives the following results of his experience:—"I commenced with a pair of young fowls, whose grand-parents were imported birds. The pullet began to lay on January 14th: on March 3rd she hatched sixteen chickens, and again began laying when these were five weeks old. On May 27th she brought out another fine brood, and recommenced laying in about a month. On August 12th she hatched a third brood; and in six weeks laid again. In October she wished to sit a fourth time; but, being so late in the season, I prevented her. On the 13th of December, 1851, she again began to lay, and continued to produce her daily egg, having laid, that year, 104 eggs. Of the March brood, some of the pullets began to lay when about eight months old; and several of the cockerels weigh about 9½ lbs.; cockerels of the May brood, about 6 lbs. As regards the hardy nature of the breed, I need say no more than that I have not lost a single chick from illness."

After setting his hens, the breeder should be careful to have them off their nests at stated times, and see that they are liberally fed with barley and soaked bread. The strongest chickens come from the eggs of hens twelve months old, or the second season of their laying. To have a healthy stock, cock birds should be changed every two years, and never

be bred from the same stock, if it can be avoided. By this method the quality of the breed will be kept up. It is quite as easy to have good birds as mongrels. Chickens, to be large, must be abundantly and nourishingly fed, on the same principle that a race-horse, from the day he is foaled, has his milch-cows kept for him. At ten weeks old, they are just at the age when they have scarcely a feather to cover their nakedness. After this age, however, if they are kept warm, and fed generously, they speedily become covered with feathers. They usually prefer oats to barley, which are, in some respects, better for them.

The principal circumstance in which the treatment and management of the Cochin-China fowls differ from that of the lighter varieties, is in the mode of their roosting. They do not require to be coddled. At Shanghae, the winter weather is, at least, equally severe as it is with us in England. The vacant space beneath the greenhouse stage, makes an excellent winter roosting-place. If kept clean, and they are prevented from getting into the house, there will be little fear of their injuring the plants.

These heavy birds, indeed, should not be allowed to ascend a high perch. Those permitted so to do, invariably become deformed in the breast-bone; and have an unsightly appearance, independently of their health being greatly impaired. When a hen's ladder is placed against the perches, the fowls will make use of it in mounting to roost; but in coming down, they almost always use their wings alone. Many persons attribute this deformity in the breast-bone to injury sustained in these hasty descents (which are often as bad as a fall); but it proceeds rather from the great weight of the fowl bearing upon one point for so many hours together. Where this is the case, either high or low perching is likely to be injurious. But, be this as it may, high perching is proved to be so, to heavy fowls.

Broad perches, near to the ground, are sometimes provided for them; but a bed of straw, either on a wooden platform, or in a basket, so large as to avoid any danger of injuring the plumage, is to be preferred. The straw should be shaken up, cleansed every day, and renewed once a-week, or oftener, if necessary. The purchase of this straw occasions an additional outlay of money; but this will be found no loss to those who have even a small garden, as the rotted straw, mixed with fowl's manure, forms a valuable addition to the dung-heap.

When ordinary care is taken of the Cochin fowl, it is not found more delicate in habit, or more difficult to bring to perfection, than any English fowl; and the chickens are quite as easy to rear. Cross-bred chickens are sometimes very delicate, subject to roup, and difficult to raise; but this is seldom the case with the pure breed. On the contrary, these are generally thriving, and hearty-feeding chickens. Where common poultry are fed twice a-day, it is desirable to feed the Cochin-China three or four times, and to give the food so abundantly that some may be left after the fowls have satisfied themselves.

Viewing Cochin-China fowls as subjects of profit or loss, it has been contended that the Polish fowl may be more profitable than some of the Cochin-Chinas; but, if they are fed alike, it is certain that the best Cochin breed will surpass the Polish in the number of their eggs. Some are of opinion that the Spanish are a more profitable variety than the Cochin; but a gentleman, who has paid much attention to the subject of profit and loss, says, that "after a fair trial of almost every breed—the Spanish being the last—I have given them all up but the Cochin-Chinas, and now keep no others. From March, up to the 1st of May, I have hatched 131 chickens, and disposed of a large number of eggs—all from six hens. I have now chickens, hatched the first week in February, weighing 9 lbs. per pair; and one of the pullets laid an egg before she was four months old."

It has frequently been asked, whether the brown or white Cochin-China fowls are the more productive?—and whether the latter are so superior to the former as the great difference in price would lead us to expect? But no very marked difference in productiveness has yet been observed. The extra price is asked and obtained for the rarity of the colour—many fanciers being willing to pay something more for an article which their neighbours do not possess. The same conventional value is attached to most other objects of fancy.

Cochins are highly esteemed as table birds; and, as such, may be turned to profitable account. The great size and weight which they

attain, at a very early age, render them desirable for the table; and they cost but little for food in the short space of time required for rearing them. At four months old, there should be no difficulty, under ordinary circumstances—allowing a good run and fair feeding—in getting pullets to three-and-a-half pounds, and the cockerels to five pounds, live weight; and, by being then cooped, they may, with ease, be grown still larger. In flavour they are most excellent, and their tenderness is unsurpassable. Another valuable produce of the Cochin-China fowls, and consequently a source of profit, is their feathers, which are nearly equal to goose down.

All circumstances considered, in reference to the Cochin fowl, it may safely be said that it is the most profitable for the poor man and the farmer; viewing it, not as an object of fancy, but as productive stock. The early period at which the pullets begin to lay, is capable of being turned to valuable account by the cottager while getting his stock together, by the restoration, during the scarcity of winter, of the little capital expended during the year. Thus the owner, who has raised or purchased chickens in the spring, may obtain a brood or two late in the summer, or early in autumn, and have chickens ready for the table about Christmas, which might partly or wholly replace his original outlay.

If any of the fowls exhibit symptoms of disease, a jalap pill should be given, and they may be crammed a little with stiff barley-meal.

The whiteness, or scurfy appearance of the cocks' comb is a kind of disease which does not appear seriously to affect their health; but it greatly militates against their appearance, and should be taken as a true sign that the birds are not in a perfect condition. The disease is not confined to the comb only, but spreads itself down the neck, both before and behind, denuding it of its feathers, and leaving only their stumps. For the cure of this, some have considered high-feeding to be best; but the following recipe has been given by Mr. Payne. He says—"A lady friend of mine, who has just returned from India, after a residence of eight years, happened to see my fowls, and told me that the 'Kulm fowl'—which I believe is the 'Malay,' and of which she kept a considerable number in India—was subject to the same disease, and that the natives, upon discovering it, applied *cocoa-nut oil and turmeric*. She strongly advised me to do the same, which I did immediately, and with the most complete success; for it stopped the spreading of the disease at once, and very soon restored the comb to its original colour: but for the return of feathers, I must wait till the moulting season."

An experienced amateur thus speaks generally of the Cochin-China, or Shanghae fowl:—"A great deal has been said and written about the colours and tints of these fowls. I say tints, because even the buffs are subdivided into lemon-buffs and buffs proper; and if it may be included in tint, as it is allowed to be equipotential in merit, to the cinnamon. Then we have the various grades of shade, till we come to the downright partridge colour. Some amateur, or some scientific colourist, should take the lead, and lay down a new scale of degrees in this matter; it would be useful, and, I opine, it would be acceptable. Supposing such a one should say at once—There are three grand divisions of these coloured birds; viz., the buffs, the cinnamons, and the partridge-browns—not forgetting the whites and the blacks of this race. These three divisions of coloured birds are again subdivided into the self, the pencilled, and the spangled, or mottled, buffs, cinnamons, or partridge-brown. I do not see why a pencilled bird should not be as good as a buff-coloured one: they are as fine in the fluff and feather, and decidedly, as I could show by reference to my own stock, much prettier specimens. I have two pullets of one year, and another of the year preceding, of exquisitely fine buff, charmingly pencilled (almost as richly laced as a gold or silver-laced Bantam), and of fine shape and luxuriant proportions—of finer development, as a whole, than any I possess. But, however this may be determined, one thing is very certain—no yard will ever remain, throughout the year, as it may be constituted in spring. Shape, size, gait, and weight, may be assumed as permanent characteristics; not so feather. In the birds of the air, and of the water, and many others, as the ostrich, the emu, &c., feather is as invariable as the other characters. But either it never was so from the creation, or it has become otherwise from circumstances

and time immemorial, that the domestic races of poultry vary their plumage *ad infinitum*. Not only do white or black Bantams, cuckoo-Dorkings, and game-fowls *sport* in the feather, but the more uniform breeds, the black Polanders, the Minorcas, and even the Spanish, take a white speck spot, and even feathers, when the fit is on them. So with the Shanghaes. The breeder may start in spring with buffs, cinnamons, or partridge-coloured parents, and their progeny in November will display all the colours of the rainbow, except, to be sure, the blue. Nay, *they may put on* the affirmative of due proportions of the whole as white, or the negative as black specimens. The yard may be kept to one colour by cutting the sporters, and the propensity to sport may be checked, but, I believe, never subdued. Fancy must direct choice in colours, and the leading fanciers will give the *éclat* to their preferred colour. It is true that the lighter tints are of the more delicate feathers, perhaps of the more delicate flesh. But the dark birds are the finest, largest, and, almost invariably, the fairest specimens, which are, at the same time, of good growth and weight, of good buff colour, and so rare, that they are very highly prized.

"The Cochin-China, or Shanghae fowl, which has made so great a noise, and brought about so great a revolution in poultry-yards and poultry shows of late years, may possibly retire from public estimation with no less silence and rapidity. For, unquestioned as its novelty of form, beauty of plumage, and gentleness of disposition and manners are, its usefulness as a supply for the tables of the upper classes, though not as a contributor to the couch and the pillow, by its soft and silky redundancy of fluff and feather, have been long under anxious consideration. It is well to speak of the game-like flavour of its delightful flesh, and to dilate on the pounds avoirdupois which *they* individually rise to. Is it as well to be silent upon the large proportion of offal?—to ignore the fact of the boasted game-like flavour being unattended by the shortness of substance so acceptable to the refined palate?—to be blind to the colour, and insensible to the pachydermy? Regarding them as such exceedingly pleasant inhabitants of the yard, and ornamental to the lawn and the pleasure-grounds, we grieve over the defects we are bound in candour to admit. The frequent announcements of salesmen and auctioneers, of whole stocks and yards to be disposed of, is far from a disallowance, much less a contradiction, of our position.

"In respect to size and weight, there is much solid ground for scepticism. Doubtless there have been individuals of large developments, with legs several inches in length and three in girth, and a great length of middle claw, which would be important items if reducible to broth or jelly; but such growths are not average, or even usual. In my own yard, and in every other I have inspected, I have seen nothing approaching these models. I do not say that Mr. Sturgeon may not, out of ten or twenty scores of annual produce, have been able to select *a very few* of such specimens as, at the second or third year, may have reached twelve pounds in the male, and nine in the female; but even that gentleman, the spirited and highly commendable proprietor of the breed, does not achieve or speak of more. I have heard mention of even greater weights. Inspection has convinced me of the soundness of the late Lord Althorp's advice to graziers, 'Not to look at their own cattle with too much partiality,' so as to see them in points of view which sober eyes cannot find or allow. I think I should not be hazarding too much to say, that the weight of Shanghaes does not absolutely exceed that of the finest Dorkings; and, relatively to use—sinking the offal—would fall below it. I have possessed both in their best forms and degrees.

"The propensity to incubation, in the female of this breed, is so remarkable, so persevering, so irremediable, that, while it would make a few hens desirable to the general breeder, it is a serious drawback to them as sale stock. They begin to lay their winter supply of not large, but delicious eggs in the midst or end of November, and lay regularly, for six or eight weeks, one egg a day. Then they assume the broody humour, and are with difficulty diverted from their purpose. After some eight or ten days' seclusion, they reappear as layers to the extent of from ten to twenty eggs, when they again claim the sweets of maternity. Then you cannot easily turn them from their purpose. I have frequently taken hens

off their nests, put them down on the floor, and left them, only to find them hours after in the same spot, and in precisely the same accidental posture, like dead things, as I left them. They are the sweetest, gentlest, and most rational of irrational mothers. The chicks are hardy and 'fendible'—a very excellent Yorkshire word, with which the next edition of Johnson may be enriched. It is a very, very rare occurrence for one to die, or to be weakly. The soft and warm fluffiness of the hens makes their brooding most effective.

"I may add that they are most conformable creatures in this, as in most other respects. They will sit wherever you wish to place them. One winter, about the beginning of January, I diverted some hens from this purpose for a week or two; in February, they became again *broody*, while the weather was yet untoward. I brought them from their laying-nests in the poultry-house, and placed them on eggs in cupboards in my kitchen. They then sat, hatched, and got through the chickenhood of their offspring as kindly as could be. It was a subject of mirthful observation to my household, that the same hens, when again, in May or June, they became prone to multiply, bounced up, in profound fussiness and importance, to the kitchen, and demanded, by pecking at and opening the door that stood ajar, admittance to their comfortable winter quarters. They were, unresistingly, put on eggs in a new place; but, as that was not far from the kitchen door, they sometimes repaired, after their periodical recreations, to the old and favoured, instead of their new locality, of which they only needed a gentle memento to resume their maternal duties. I have spoken of the rarity of a weakly chicken; and I add, that I do not remember ever to have lost one, except by some such death as the mother treading on it, or a door blowing-to, and killing one.

"*Table Qualities.*—Since writing the above jots of experience, I have sat down to a young Cochin-China, or Shanghae chicken. It was a deformed bird, though otherwise very handsome, and therefore condemned. Its weight, ready for spit, was only 5½ lbs., but of fine appearance, sent up turkey-wise. The quality of the meat was better than I expected. Still, its flesh must be pronounced coarse in fibre, compared with the old breeds of poultry. There was great whiteness, plumpness, and juiciness—the substance as beef to veal, or as codfish to turbot—not denying that both the antecedents in the contrasts are excellent eating. The legs were, apparently, of whiter meat, and more delicate consistency, than is usual with the legs of chickens or of turkeys. It will be obvious, hence, that I do not consider their table-excellence unsurpassable or unsurpassed."

In judging these birds, another amateur suggests the consideration of the following points:—

Head.—Beak to harmonise with colour.—Eyes red (*pearl eye too Malay like*).—Comb single, small, straight, evenly serrated, fine in texture, and free from excrescences.—Earlobe in cock, red, full, and long; in hen, small.—Face, red.
Body.—Very square; *i.e.*, broad and deep in the keel, with abundance of thick, soft plumage, giving breadth behind; short neck.
Tail.—Remarkably short; in colour harmonising with that of the bird; almost buried in long loose feathers.
Wing.—Folded up very close, so as to leave the fluff of the thigh standing out full.
Legs.—Yellow, and heavily feathered.

Colour of Chinese Fowls.

Cinnamon.—Cock and hen both to be cinnamon, and, as far as may be, to agree in shade; hackle marking nothing deeper than a golden tinge; absence of black in tail and flight, a beauty; colour throughout of a uniform shade.
Buff.—Cock and hen to agree in shade to a great degree; marking on neck-hackle to be tolerated in hens; tail, colour of plumage, or mixed with black; plumage clear, unflecked, and to agree in shade throughout.
Grouse.—Very dark; each feather a mixture of rich brown and black, as in a pheasant. Breast and tail of the cock, black [*according to the Dublin amateurs*]; hackle richly marked. In the hen, breast like a pheasant.
Partridge.—Dark; the plumage of the hen a minute mossing. Cock with black-spangled breast, and dark-red hackles.
Black.—Pure deep black; no coloured feathers.
White.—Pure and clear white; no foul feathers.
Cuckoo, or Grey Shanghae.—All the plumage evenly pencilled, clear grey; no mixture of red or yellow tinge.

THE MALAY FOWL.

Malays are a tall race of birds, of high courage, excellent nurses and incubators of other species, but moderate layers themselves, and not easy to fatten to a fleshy state. The name of this fowl implies that it is a native of the

peninsula which forms the southern point of Hindostan; and is a title probably much more correct than most other names of poultry derived from the countries whence they are supposed to come.

Malays stand very high on the legs; are long-necked, serpent-headed, and carry too much offal for the poulterer. They are, accordingly, not so valuable to him as are some other fowls. Their flesh, before cooking, is not tempting in its appearance, and they very often have yellow skins. Their colour is various: some greatly resemble the duck-winged game; others are dark-brown, streaked with yellow. Black Malays are handsome birds; and the white variety, with bright yellow legs, is a remarkable creature. Good Malays, although unprofitable, certainly adorn a poultry-yard; but having a domineering disposition, with the power to indulge in it, they frequently are the cause of considerable annoyance. Chittagongs are members of the Malay family, which is widely spread throughout the East. Crosses with Malays produce fine birds, but they are of uncertain qualities and colours. Their weight is considerable; and their efficiency as duelists terribly certain, if it were the fashion now to indulge in such practices.

Years ago, there used to be a variety of fowls much in request in England, called the "Shakebag," or the "Duke of Leeds' fowl;" a nobleman of that name having been a great amateur breeder of them. These fowls were as large as the Malays, but differed from them in the superior whiteness and tenderness of their flesh, as well as in their very superior combative qualities. Mowbray thus writes of one in his possession:—"The only one I ever possessed was a red fowl, in 1784, weighing about ten pounds, which was provided for me, at the price of one guinea, by Goff, the dealer, who then lived upon Holborn Hill, in London; and who, at the end of two years, received him back at half a guinea, having allowed me, in the interim, three shillings and sixpence each for such thorough-bred cock chickens as I chose to send him. At that period, the real 'Duke of Leeds' fowl' had become very scarce, which induced the dealers to put Shakebag cocks to Malay hens, by that means keeping up the original standard size, but entirely sacrificing their colour, and delicate flavour of the flesh."

The name of this fowl seems to have arisen from the old practice of cock-fighting, when the *fancy* used to challenge *all-comers*, who had their cocks concealed in a bag; and the tremendous size and power of the Duke of Leeds' fowl proving so far superior to all competitors, as usually to insure conquest. The breed eventually obtained the name, *par excellence*, of *Shakebag*, since corrupted into Shackbag.

Mowbray informs us that this fine bird was not unfrequently substituted for a turkey; and this, as he facetiously adds, "to the great convenience of poulterers and inn-keepers of Wokingham and elsewhere."

In judging this bird, an intelligent writer suggests the following points for a basis:—

THE COCK.

Head.—The beak, horn colour.—Eyes, orange red, sunk beneath a projecting eyebrow.—Comb low, indented.—Wattles, very small, more properly folds of the skin of the throat than wattles.—Earlobe, rudimentary.—Face, brilliant crimson.
Neck.—Orange red.
Back.—Marone.
Saddle.—Orange red.
Wing.—Shoulder, marone; steel-blue bar across; flight-feathers, bay.
Breast.—Black, with irregular bay markings.
Tail.—Scanty, drooping.
Legs.—Olive-brown.

THE HEN.

Head.—Same characters as cock, but less developed.
Neck.—Middle of feather brown, edges golden, shaft straw colour.
Back.—Brown, shaft of feathers straw colour.
Breast.—Brownish fawn colour.
Tail.—Brownish black.
Legs.—Olive-brown.

The Malay is widely distributed. It is to be met with largely in India, China, the islands of the Indian Archipelago, the South-Sea Islands, and America. Its introduction into England is of comparatively recent date; and as, in our culture of poultry, varieties of food and climate enter so largely into the consideration, diversities will necessarily arise; and, whether the birds exhibited be brown-breasted reds, cream-coloured, white, or otherwise, all we mean to suggest is, that main descriptive points shall be attended to, and lots assorted. Of the sub-varieties of Malay, there are three well-defined. The first, Temminck's Giganteus, long cultivated in India, under different names, stands nearly two feet in height. The second, the variety commonly imported

from Singapore—that generally seen in the English poultry shows—is a smaller and more leggy breed. The third, cultivated in Ceylon for fighting, is about the size of our game-fowl. In this the comb is of the same character, but scarcely above the level of the skull; no wattles; neck naked; tail very long, carried on a level with the back; feathers very narrow, drooping, almost sweeping the ground; primaries turning outwards—almost leading one to suppose it indebted, for these peculiarities, to *Gallus furcatus*, found wild in Ceylon. Tail of hen drooping in like manner; colour and markings, same as in description. This last kind is rare.

Another, who has observed the bird in India, thus gives his opinion:—

"*The Cock.*—General carriage and appearance, restless, independent, and commanding; head largely developed, and somewhat eagle-shaped; the bone above the eye projecting and overhanging it, giving it a fiery, savage expression; iris of the eye, pale straw colour; beak very strong, particularly the upper mandible, which is thick, and curves downwards to the apex; neck long and snake-like; the comb a low, double, warty excrescence—the points or papillæ on its surface being very *close* and minute; face nearly devoid of feathers, the skin being of a bright blood-red colour; throat also nearly naked, and red, extending from behind the ears to a point three or four inches down the front of the neck; wattles and ear-lobes rudimentary; hackle feathers of neck rising as a thick mane from its upper third, and falling *in* to the neck at its lower part in front of the shoulders, not spreading over them as in the game-cock. Shoulders of the wings greatly developed, standing out prominently from the body; body broad in front, tapering off, and descending to the rump; breast round and full; skin covering the crop in the centre of the chest, naked, and of a livid red colour, particularly remarkable when the craw is full; tail close, somewhat pheasant-formed, and but slightly elevated; legs rather long; feathers of the thigh very close; leg, or shank, strong, clean, and of an olive-yellow tinge; foot large and strong; spur thick, not sharply pointed. Colour—general hue of the neck, back, and rump, a deep glossy chesnut-red; the neck hackles being brownish-red in the centre, and of a brilliant chesnut-red at the edges; rump hackles entirely of a very deep and beautiful glossy chesnut-red; lesser wing-coverts, a rich glossy lake-red colour; greater wing-coverts of a deep metallic steel-blue, with green reflections; primary flight-feathers a dull black, edged, on the outer web, with chesnut or bay; secondary flight-feathers also dull black on their inner webs, and a light bay on their outer webs, those feathers of the flight nearest the body being tipped with metallic steel-blue; tail-coverts of a metallic blue-black; tail-feathers of a dull black, showing some metallic lustre on their outer webs; general colour of the breast, under part of the body and thighs, a dull black, tinged and blotched with brown.

"*Hen.*—Shape of head, neck, and body, much as in the cock; tail close, and carried generally more elevated; comb of the same general character as the cock's, but nearly rudimentary. Colour—head and neck a dark chesnut-brown, with brighter edging to each feather; back and body generally a clouded chesnut; tail—inner webs, dull black; outer webs, chesnut; wing-flights, a light chesnut, edged with black; inner webs nearly black; feathers of the throat scanty and short. Some hens, in colour, approach more to the grouse character of body feather, and some are spangled with white. The feathers of the Malay fowl sit exceedingly close to the body of the bird, and are more scanty than in any other variety of poultry."

At poultry shows the Malays are not favourites, as may generally be inferred from the following remarks, made by one of the committee of the Annerley show:—"In arranging the prize-list, and deciding upon the regulations for the next meeting at Annerley, the committee have been actuated by a desire to conciliate all parties. How far they are justified in doing so, depends upon the co-operation of those who are interested in the rivalry and emulation which properly-conducted exhibitions usually excite. Yet there are, doubtless, some in the poultry world who have still reason to complain. The first cause is the omission of the 'Malay' in the prize-list. Now, this omission has not arisen from any neglect to, or want of appreciation of this class of birds; for its merits are at once acknowledged, and have been fully discussed; but the *onus* rests entirely with the owners

themselves—they won't bring them out. From this cause, like the officials in the celebrated 'Circumlocution Office,' they appear to try 'how not to do it.'

"I can bear my own humble testimony in favour of the Malay, not only for its indomitable courage, but for its delicacy of flesh and general utility; and, however much the owner of a courtly Spanish or plebeian Dorking may pooh-pooh its appearance, its time has yet to come; and we should be glad to see it take a prominent position in our list. But how stands this class at exhibitions? At Annerley, last year, four pens were shown, and the same number only at Birmingham in the adult class. The reply, of course, will be, that nothing has hitherto been held out to induce emulation in this peculiar variety. Yet it is not too late, if a sufficient amount of competition can be anticipated, to offer handsome prizes for these neglected but valuable birds, whose owners always seem reluctant to exhibit. Divested of all extraneous motives, the real object of poultry shows is, 'purely and simply,' the improvement of the various breeds. If any should doubt that such is their ultimate result, let them contrast a Cochin at Hué with an English specimen of the same class, or taste any native bird in its own climate, and one from the breeds of our distinguished amateurs or dealers.

"In 1847, I had an opportunity of sharing a variety of presents from high Cochin-China authorities. Many fowls were included, and I can scarcely conceive that the present bird, in this country, ever emanated from this same stock. Ducks, also, presented the same melancholy comparison to the prize birds here. So much for cultivation and care! But why should the Malays be doomed to a *status quo*, from the apparent diffidence of their possessors? I have oftentimes, with much satisfaction to self, 'discussed' a portion of 'Malay' on their own coasts; and if they be good there, taking other classes of birds as precedents, why allow them to degenerate here?"

BANTAMS.

Bantams are high-spirited little birds; good layers; delicate to eat; useful as destroyers of insects and small vermin; and pretty domestic pets, but dreadfully combative.

The varieties of Bantam fowl cultivated in England, some thirty or forty years ago, would fill a longer list than they do at present.

The gold and silver-laced, or the laced gold and silver, are the most popular favourites, and were most carefully cultivated under the auspices of the late Sir John Sebright, if they do not owe to him their existence as a breed. The baronet's mode of proceeding is thus described by one who had opportunities of knowing it:—"As I am living only nine miles from Beechwood, it may be interesting to you to learn, that neighbours, who knew the late Sir J. S., say that he sometimes hatched five hundred chickens in a season, but *killed* all those which showed the slightest irregularity of colour, and only reared a very few. Ordinary people cannot afford to breed fowls on that system; and, even if they could, such wastefulness and wantonness, approaching to cruelty, would not be creditable to them."

Mr. Richardson says, that the forms of the Bantams are usually modelled after the Game and the Hamburg fowls. The Sebright has its legs perfectly naked down to the toes. The cock, of this breed, should have a rose comb, full hackles, a well-feathered and well-carried tail—from which, however, the sickle feathers should be absent, and he is thence said to be *hen-tailed*—a stately courageous demeanour, and should not be quite a pound in weight. The lacings, which must be fine and regular, should follow the edge of the feather, on a golden yellow or creamy-white ground. The bird is of high courage, and will fight with great resolution. The attitude of the cock is proud and haughty; his head being thrown back so as nearly to touch the feathers of his tail, much in the style of a fan-tail pigeon. Well-bred birds fetch high prices.

The white Bantams, kept by her majesty at the Home Park, are of a perfectly white colour, and exceedingly small size; they appear also to have exhibited some peculiar traits of habit and disposition. The cocks were so fond of sucking the eggs laid by the hen, that they would often drive her from the nest in order to obtain them. They have even been asserted to attack her, tear open the *ovarium*, and devour its shell-less contents. In order, if possible, to subdue this unnatural propensity, her majesty's keeper first gave the cocks a hard-boiled, and

then a marble egg to fight with, taking care, at the same time, to prevent their access to the hens or to any real eggs. After a few weeks the birds gave up their unprofitable labour, and, as the keeper had anticipated, wholly abandoned, for the future, all attempts to destroy the hen or the actually *laid* egg.

"The black Bantam," says Mr. Dixon, "is a beautiful example of a great soul in a little body. It is the most pugnacious of its whole tribe. It will drive, to a respectful distance, great dunghill cocks five times its weight. It is more jealous, irascible, and domineering, in proportion to its size, than the thorough-bred game-cock himself. Its combativeness, too, is manifested at a very early period. Other chickens will fight, in sport, by the time they are half-grown; but these set to work in good earnest. One summer we bought a small brood, as soon as they could safely be removed from their mother. There were two cockerels amongst them. They were little things, beautifully shaped, but ridiculously diminutive—fairy chickens, some of our friends called them. They had not been with us long before the liberal supply of barley began to excite them; and the two little imps spent the greater part of their time in fighting, which only made us laugh, judging serious injury impossible. But shortly observing one unusually triumphant (for it had always been a sort of drawn game between them), and the other walking about in an odd uncertain manner, though firm and fearless, I found that this latter had both its eyes closed from wounds received the day before. I carried it to my dressing-room, to relieve it by sponging, and set it on the stain-cloth, while I went to fetch some warm water. Still blind, it began crowing vivaciously. In a few minutes its eyes were unsealed, and it was returned to the yard. But battle after battle was immediately fought, and we were obliged to *eat* one of the combatants to prevent the mutilation of both. We can, consequently, confirm the statements of those who praise the excellence of their flesh, particularly if it be accompanied by a little good bread sauce. One, that I have seen, was in the constant habit of fighting, or rather sparring, with a little spaniel that belonged to the same owner. Though apparently attacking each other with great fury, they never seemed to be really in earnest. The arrival of strangers was generally the signal for the commencement of this sham fight, which ended without bloodshed as soon as one or both of the combatants were out of breath. The spaniel was mostly the first to give-in, when the victor evinced as much triumph as if he had vanquished a feathered foe.

"The black Bantam, in his appearance, is a pleasing little fellow. He should have a full rose comb, clean and sinewy legs, glossy plumage, with almost metallic lustre, of a different tint to the glancing green of the Spanish fowl; arched and flowing tail, waggish impudent eye, and self-satisfied air and gait. The hen is of a duller jetty-black, is less knowing in her manner, and, I think, in every way of inferior capacity. These little black hens have great credit for fulfilling their maternal duties well; but I have found them less affectionate and careful than other Bantams. They are great stayers at home, prowling very little about, and therefore are desirable in many situations, such as suburban villas that are surrounded by captious neighbours. They will remain contented with the range of a moderate stable-yard, and the least bit of shrubbery; and will do much good by the consumption of numerous insects. They are reputed good layers during winter; but that will depend on the liberality with which they are fed. Cooks say that their eggs, though small, are 'very rich;' which means, perhaps, that they contain a greater proportion of yolk than those of larger fowls. Guinea-fowls' eggs are prized for the same quality; and any one may, at breakfast, observe how much less a proportion of white there is in them than in those of the Turkey. Black Bantams' eggs are smooth, tinged with buff, decidedly long-oval in most individuals, and with a zone of irregularity towards the smaller end in some.

"The new-hatched chicks are covered with black down, which occasionally has a greyish cast under the belly: bill, eyes, feet, and legs black. The female chicks are not bigger than the queen of the black-and-yellow humble bees, and their slender little legs appear fitter to belong to an insect than a chicken. A desire to obtain the largest possible brood, induced me to hatch some under a great Dorking hen, because she can cover so many

eggs; but I only overreached myself. The big hen was too heavy and clumsy to officiate as nurse to such fragile atoms."

The Creeper is also a small variety of Bantam, with very short legs. In addition to these diminutive races, there is another, the Jumper, mentioned by Buffon, as being so short-legged, that they are compelled to progress by *jumps*. They are prolific, as well as excellent sitters, the hen having been known to hatch two batches of eggs in succession, without even an intermediate day of rest. These dwarf fowls were described by Aldrovandi, more than two hundred years ago; and also, much further back, by Pliny, under the designation of the *Adrian breed.*

A gentleman of known experience suggests the following points for a basis :—

SEBRIGHT BANTAMS.

THE COCK.

Head.—Best helmet comb; best, fullest, and clearest black eyes.—The ears, best, largest, and clearest white.
Neck.—Hackles, shortest and clearest red, and best, laced with black.
Breast.—Clearest and best red, and laced with largest and clearest black.
Back.—Ditto.
Wings.—Ditto.
Saddle.—Ditto.
Tail.—Hen-tailed, most erect, clearest and best, red; the two longest tipped with best and clearest black; the other feathers best, laced with black.
Legs.—Clearest and best blue.

THE HENS TO MATCH.

General Appearance.—The smallest, most symmetrical, and best-feathered birds.

SILVER SEBRIGHT BANTAMS.

Characteristics the same, on clearest and best white ground.

INDIAN BANTAMS.—(*Clean Legged*).

THE COCK.

Head.—The comb, best double, best square, best spiked behind.—The eyes, brilliant orange.—The ears, roundest and clearest white.
Neck.—Hackles, best, fullest, and clearest golden red.
Back.—Best and richest golden marone.
Saddle.—Ditto.
Tail.—Best carried, fullest, and best glossy green black.
Breast.—Clearest and best reddish fawn colour.
Legs.—Best and clearest olive, or best and clearest yellow.
Wings.—Shoulder, best and richest marone; flight-feathers, best and clearest bay.

THE HEN.

Head.—The comb, best double, best square, best spiked behind.—The eyes, brilliant orange.—The ears, roundest and clearest white.
Neck.—Hackles, best and clearest brown in middle, edged with golden; shaft, straw colour.
Breast.—Clearest and best fawn colour.
Back.—Clearest and best brown, and clearest and best straw-coloured shaft.
Tail.—Ditto.
Legs.—Clearest olive, or clearest yellow.

In reference to the name of a species of Bantam, formerly called the Calcutta Jungle fowl, several amateurs have written their opinions, and suggested what they deem more appropriate designations. One says—"It has been hinted, that it would be better to name these birds, lately imported from Calcutta, Indian Feather-legged Bantams. The owner considered it better to let them keep the name *under which they were purchased at Calcutta*, until some certain intelligence respecting their origin should make a change advisable. When new fowls have been imported, the owners have often appeared to seek a well-sounding name, rather than one which should continually point to their origin. If the last rule had been observed, the nomenclature of fowls would be less puzzling than it is in many instances. The little fowls in question were called Jungle fowls; but it seemed likely they had been domesticated, as, although very wild, they were not sufficiently so for wild fowls. They came over in the *Lady Jocelyn* screw-steamer, where a lady passenger kindly took them in charge, and fed and noticed them after every meal during the passage. Calcutta Bantams would be a better name for them than the above."

Another says—"The little fowls which won prizes at Birmingham and Colchester, and entered under the title of Calcutta Jungle fowl, were bought at Calcutta as Jungle fowl, and have some similarity in the head to the Bankiva, being for a long time very wild. These are the circumstances which attached to them the—probably inappropriate—name of *Jungle* Bantams. Far from having lost the sickle feathers and hackle, like the Sebright, their furnishing is quite ridiculous for their size. The hackle of the old bird is bushy, and long enough to reach the ground when he feeds; and the tail so well furnished with sickle feathers, that, in

windy weather, its owner is borne along with it, as if it were a sail. The plumage is black, with a brilliant green metallic lustre; and about the head and neck are streaks of white, which increase as the fowls approach maturity, at which time the head is nearly white. The legs are feathered, not booted. The fowls are Bantam-like in size, very plump, compactly made, short in the leg, and exceedingly spirited. The cockerels will fight a cock of any size, and make large Brahmas fly before them. The little hen is a good layer. The eggs are almost invariably fertile. When the chickens are hatched they are tiny black and yellow things, with a slight appearance of a turned ridge on each side of the head, a little distance from the eye. They are active and hardy—exceedingly so, considering the change of climate they have had. The cock is a capital father; as soon as the little hen will let him (for she is a virago when she first gets her brood), he takes as active a part with the young ones as any hen can do, leading and feeding them by day and watching them at night: this attention he continues long after the hen has turned them off."

"The Calcutta Jungle Bantam," says an informant, "is not a Jungle fowl, but a domestic bird from the coast of Rangoon and the Straits, and, although timid, has nothing very wild. The real Jungle fowl I have shot, in great numbers, on the range of hills running through Midnapore to Rajmahaul. The cock is very handsome and beautiful, delicately formed, and something less than half the size of the Malay fowl—his carriage and colour much the same; but he has a very small head, with single comb; his legs are not long, but clean, with olive-yellow tinge; he stands very upright; spurs thin, and very sharp. He is courageous, and generally has six or eight hens. The hen is handsomely made; blackish-brown, speckled, with a diminutive head, and very dark-red round the eyes. I have known many attempts to domesticate these fowls, but none succeeded, even when the eggs were set under a house hen; when the chicks were able to provide for themselves they went off."

Another says—"I believe, as yet, India is known to possess but two species of Jungle fowl—*Gallus Bankiva* and *Sonneratii;* the former is supposed to be the origin of all our domesticated varieties, although doubted by some. Experience has proved that it can be domesticated, and that the cross is fertile with others, *inter se*. Sonneratii have been bred with Bantams, but rarely; the cross was not fertile, thereby proving it a distinct species. These birds are described as feather-legged; therefore I take them to be Bankiva, bred *in-and-in:* by which means the feathered leg is produced, and the loss of sickle feathers and hackles, the hen-hackle being produced, as in the Sebright Bantams. I had, many years ago, from India, Bantams identical with Bankiva, although smaller, the hens of which were very wild. By *in-and-in* breeding I produced the crested Hamburgs (known as such for a century before the erroneous nomenclature of 1848), wanting the sickle feathers, and with feathered legs, which I have found most difficult to eradicate, each year producing one or two, notwithstanding the introduction of new blood. I have a pullet of this sort, which I should have killed, but have kept, thinking some of the curious in varieties would like to have her."

RUMPLESS, SILKY, NEGRO, AND FRIZZLED FOWLS.

Rumpless, Silky, Negro, and Frizzled fowls, are interesting birds, and deserve the attention of the fancier. Their leading characteristics are indicated by their names, and the first are found of all colours. They are more abundant in France than in England, and have a singular appearance, reminding one, to some extent, of the English sheep dog. Their appearance never fails to attract attention, whether in the yard or at the exhibition; but they find no favour with the epicure, depriving him of a dainty morsel.

"Of Silky fowls," says Mr. Richardson, "there are several varieties, mostly direct importations from the East, their merits being unduly appreciated, and their cultivation as good as neglected. As an exception, Mr. Bedingfield, of Ditchingham Park, Norfolk, adopting the judicious plan of having only one sort of fowl about his house, selected silk fowls for the purpose. They increased well, laid a sufficiency of eggs, and proved most docile sitters and nurses, both for their own young, and for pheasants and partridges.

Some of the hens would submit to be placed on a nest of eggs that might happen to be found in the park, and took to them directly, hatching them off without further trouble. They were, of course, so posted as to make her sit at once. These silk fowls were of the kind sometimes called Hong-Kong Bantams—small, short-legged, and but slightly furnished with wings and tail, and, in the eyes of some beholders, very pretty. People condemn a thing seen in a dealer's cage, or an exhibition pen, which they would delight in if they made its acquaintance at a country mansion. Still silk fowls are not *show* birds, and find but little favour at Birmingham. But till the Cochin-China epidemic had a little subsided (and the remedy of bleeding the purse was boldly practised on patients in an advanced stage of the complaint), the phœnix itself was 'pooh-pooh'd' into the background. There are silky fowls with black skins; and they make a near approach to negroes."

Of the Negro fowl, Mr. E. L. Layard, brother of the distinguished Ninevite discoverer, thus writes from Jaffra, Ceylon:—"The *kallumas-kukullo* of the natives is, as the name implies, a fowl with *black flesh;* its bones are also black; and, on table, it is a revolting-looking dish. But taste it! No other fowl, in this country, can compare with it for juiciness and tenderness. I never saw this fowl in England; here it is abundant. The prevailing colour of the true breed resembles a white fowl drawn several times through a sooty chimney! The skin, the eye-wattles, legs—in fact, all fleshy parts bearing the same *leaden* hues. It is little eaten by the Europeans, on account of its colour. I am, however, glad to get it on *my* table; and always esteem it (knowing, from experience, its good qualities) as one of my most favoured dishes."

The Frizzled fowl—so called from the frizzled and crisped appearance of the feathers, and not from a corruption of Friesland, at one time erroneously conceived to be its native country—varies as much in colour as the Rumpless fowl, and is quite as striking to an unaccustomed beholder. The natives of Ceylon, where it is occasionally seen, say that it originally came from Batavia. This agrees with Temminck. It is susceptible of cold, difficult to rear, and mainly prized as a curiosity.

BOLTON GREYS, CREELS, CHITTEPRATS, Etc.

For judging these fowls, the following points are suggested as a basis:—

DUTCH PENCILLED FOWL (GOLD OR SILVER).

THE COCK.

Head.—Best double rose comb, best square in front, most erect, and best spiked on the top and behind.—Wattles full and round.—Ears largest and best white.
Neck.—Clearest and best white.
Breast.—Largest, clearest, and best white.
Rump.—Largest and best clear green, black spot on the end of the feather, and clearest white ground.
Wing (in four parts).—1. Shoulder. 2. The Bars—The clearest white ground; best and clearest edging to upper and lower wing-coverts, forming two distinct black bars on the clearest white ground. 3. Flight—Clearest and best white. 4. Lacing on top of wing above the flight; *i.e.*, the inner webs of secondary flight-feathers: largest and best clear green-black spots on the end of the feather, and the clearest white ground.
Tail.—Best brown, waved with black; best and clearest silver edging, dotted with clearest and best black spots.
Legs.—Clearest and best blue.

THE HEN.

Head.—The Comb—Best double rose comb, best square in front, most erect, and best spiked behind.—Wattles full and round.—The ears largest and best white.
Neck.—Clearest and best white.
Breast.—Largest and clearest white, each feather ended with clearest black spots, increasing in size, proportionate to feathers.
Back.—Clearest white, crossed with clearest black bars, separated by white shaft.
Thighs.—Clearest white, with largest and clearest black spots.
Rump.—Clearest white.
Wing.—Clearest white, crossed with most distinct and clearest black lines.
Flight.—Clearest white, crossed with clearest wavy black lines.
Tail.—Clearest white, crossed with broadest and clearest black bars; shaft white.
Legs.—Clearest and best blue.

(GOLDEN).

Markings and characteristics the same. on a bay ground.

SCOTCH BAKIES, OR DUMPIES.

"Of this variety," say the authors of the *Poultry Book*, "Mr. Fairlie, of Cheveley Park, near Newmarket, the only person, we believe, into whose hands they have yet passed, has recorded so favourable an opinion of their merits as layers and mothers, no less than for

the table, that we shall be much surprised if, either in their present state, or crossed with other fowls, they fail to prove a useful addition to our poultry-yards.

"Mr. Fairlie obtained his birds from Scotland; but all his inquiries have hitherto been unable to trace their origin in, or importation into, that country. Their general character, however, so closely assimilates to that of the Dorkings, that the probability of their being descendants of birds of the latter breed, stinted in growth by the less genial climate of the northern district of our island, may readily be admitted; and this the more easily, when we remember how many would describe the early ancestors of the Dorking race as 'stumpy, thick-set, white fowls.'

"For a detail of their several characteristics and points, let us refer to Mr. Fairlie's own words. 'The Scotch Bakies, or Dumpies,' he tells us, 'are a breed of fowls closely resembling the Dorking in form, symmetry, and quality of flesh: the average weight of the full-grown male bird, is from six pounds to seven pounds; and of the hens, from five pounds to six pounds; their legs are singularly short, not exceeding two inches in length from the hock joint; the comb is generally single, erect, and well serrated; the body round and plump, and the tail ample. As layers, they have great merit; for after filling one nest, if the eggs are removed, they at once take to another, filling that also before they sit; during which process they fully justify the oft-repeated remark made at a late Metropolitan Exhibition—'*What excellent sitters they must make.*' They cover many more eggs than might be expected from their size; for while on the nest, they appear as if they had been pressed flat upon it. They are gentle and quiet when hatching, and subsequently prove fond and attentive mothers, their short legs enabling the chickens to brood well under them, even when standing up. I have found them very hardy; and their eggs are larger, and the shell of a clearer white, than the usual average of an English market egg.'

"In the pen of these birds exhibited at Cheltenham, in June, 1853, the ground colour of the cock's plumage was white; the hackle, breast, saddle, with the flight and tail-feathers, being a little freckled with black. The white earlobe was very fully developed.

"We are glad to learn that the effect of a warmer climate and high feeding will be carefully watched in this instance; and if there is a manifest increase in size within the next two or three generations, the probability of their inheriting some of the old Dorking blood will be thereby greatly increased; while the retention of their present dwarfed proportions would indicate their claim to be considered as a permanent variety."

In concluding this chapter, we will notice a report of the Paris Agricultural Meeting, at which various breeds of fowls held a prominent place—there being present 400 pens. There were, besides, 1,300 beasts, with goats, rabbits, zebras, lamas, deer, &c., &c., conveniently and tastefully arranged in and about a building splendidly decorated with the choicest flowers, trees (of no small size, transplanted for the occasion), fountains, painted glass, and tapestry.

In the galleries, specimens of agricultural produce, of different countries, were laid out for inspection; whilst, outside, a number of handsome tents were provided for the use and protection of the sheep, pigs, goats, and agricultural implements.

At first the poultry were sadly injured by the scorching sun during many hours of the day, as they were totally without covering, and many suffered greatly. Afterwards, however, an awning was erected, and they did better.

We must, however, remember that the French are not much used to cattle shows; and taking this circumstance into consideration, we may give them credit for the way they managed their first large exhibition of cattle.

It is somewhat curious to observe the manner in which they belied their character, as admirers of what is neat and beautiful, in distinction to that which is coarse and ugly. If you notice a crowd, it is sure to be collected round the coarsest and ugliest animal of its kind, size being the great attraction. It is the same with the poultry; they prefer the Brahmas and the biggest Cochins to the Dorkings, or to any neater or smaller breed.

There are a few, however, who seem to know what a good fowl is; and we shall not easily forget the look of disgust with which a well-known breeder of Dorkings received an inti-

mation from a "stout party," that she considered his pen of fowls very fine, and could imagine nothing better than a *fricassée* of his fowls!

In describing the most remarkable breeds of poultry at this exhibition, the reporter begins with the first named in the catalogue, as it is an acknowledged French breed, and is called—

"*The Crève-cœurs.*—I tried hard to discover the real merits and characteristics of this fowl," he says, "but obtained different and very differing accounts. All my informants, however, were agreed on one point—viz., that they were the best sort of fowl for the table that they had in France. This, however, is not saying much, for we know that the French raise large numbers of every kind of poultry for the market; they are not over-particular as to quality, or the appearance a bird presents on the table. It is seldom (very, very seldom indeed) that an entire bird is placed before you: it is either hashed, smashed, pulled, fricasséed, or smothered and smuggled into you in some way; so that often nine persons out of ten would not be up to what they were eating. This fowl has, however, by no means a badly-shaped body; it is long and low, and not very narrow. They gave me an idea of coarseness, yet I have no doubt they are hardy, useful birds in their own country; but their rusty-black feathers, and smutty legs and feet, are anything but pleasing to the eye; nor do I, in any way, commend them to the notice of the English amateur. No two Frenchmen could agree upon what their shape or plumage ought to be; and the birds, in their pens, differed very widely in form and feather. At the same time, we could not but admire them in all their characteristics, which were not of a common order, and which called forth general approbation.

"*The Cochin-Chinas* were divided into five classes—viz., yellow, white, black, brown, or freckled, and those not classed in the above descriptions. The cinnamon and buffs are, by common consent, called yellow in France; and it was not at all considered necessary that the birds should be matched. Nothing was more common than to see prize pens composed of a cock and two or more hens of quite different colours. The rule is, that there must be one cock, and not less than two hens, in a pen; but as many more as the exhibitor pleases.

"There are very few Frenchmen who have as yet discovered the value of the *Dorkings*. We trust they will allow them a fair trial, and have no doubt they will acknowledge their many excellences. The first-prize pen was greatly admired for the size and beauty of the birds.

"We now come to the *Breda* fowls. What are they? you will ask. Why, it appeared to me that they were no-breed-at-all fowls. This would certainly apply more reasonably to the birds I saw exhibited under the former name; for of all the jumbles I ever beheld, this was the most complete. There were some with tufts, and some without; some like Silver-pencilled Hamburgs, and some like cross-bred Cuckoos, and so on. I actually did not stop to see who had the honour of the prizes, but passed on to the

"*Brahmas.*—This breed has been greatly prized in France. Mr. Baker had a compliment paid him that few can boast of, and of which he might well have been proud. His birds in this class were so good that three first prizes were awarded to him. One of the pens, containing the handsomest cock of the kind I ever saw, he sold for 1,000 francs; and another, I understood, was marked out for the empress. For my part, I never wish to see better fowls than those brought to the exhibition by Mr. Baker, and I heartily congratulate him on his success.

"The other classes of fowls were not well represented. I shall, therefore, abstain from any remarks.

"The *Turkeys* were not very fine.

"For *Geese* there were only four competitors.

"The *Aylesbury Ducks* were good; but the *Rouen Ducks* were not the truest of their kind."

CHAPTER III.

CHOOSING OF STOCK.

Among the reciprocal benefits which unite the lover of poultry and his charge, perhaps a habit of early rising takes the first place. At a season of the year when a protracted winter may, in a small degree, have induced a disinclination to early exertion which we are unwilling to encourage, it is a very good thing if our favourite recreation is one which calls us betimes in the morning into the open air. One of our best judges has repeatedly advised that chickens should be fed soon after sunrise. There are few young things in whose case food has to do so much as in that of young chickens. Unlike those animals which come into the world with their clothing of warm fur, young birds depend on food for *all* the necessaries of life. For them food must secrete the requisite supplies for feathers as well as for bone and muscle; and there is never a time when good and *frequent* feeding are of such vital importance as while the little ones are fledging. A fast of a number of hours is a greater call upon the vital powers of young poultry than they can support. The careful cottagers, to whom is often entrusted the charge of turkeys, are well aware of this fact; and, although they keep the poults shut in, safe from getting wet with the dew, they feed them early.

Poor Richard says, "The eye of the master does more work than both his hands." Let the owner's eye, then, whether it be master or mistress, see that the young broods of the different kinds of poultry receive the early attention indispensable for the production of prize birds. Let the fancier see that the poultry-houses (which will naturally be close after being shut up all night) are thrown open to the wholesome morning air; that the twittering, liberated little throng have the wherewithal to satisfy their morning appetites before the twittering changes to complaint; and we believe we may prophesy, that the good which the poultry cannot fail to derive from such care, will reward their owners by a great accession of health.

To whatever branch of scientific culture we turn, whether it be to that of plants or animals, nature seems to point out that there are certain forms and characters more pleasing than others, which must be accomplished to attain perfection; as, for instance, in flowers, pelargoniums, pansies, &c. We can all recollect the long, loose-petalled flowers of former days; the onward progress of improvement pointed out that, the nearer the approach to the circle, the more perfect the form. The gardeners of the time, as in every new theory, ridiculed the idea. We have, nevertheless, seen that, however difficult or apparently impossible it is to change natural forms, it has been done. The same applies to poultry. Sir John Sebright, and other eminent breeders of cattle, arrived at similar results; and it is only by settling and insisting on points, whether of colour, shape, or markings, form of combs, &c., and discouraging shortcomings, that perfection will be generally arrived at. In estimating the qualities of poultry, there are many conflicting opinions, which is a cause of much dissatisfaction to poultry-breeders, particularly beginners; but we see no reason why rules cannot be framed, binding judges—a most important step—which would greatly lighten their labour; because the public, being made acquainted with a given standard, would breed to points. This would also prevent the caprice of judges, so much complained of.

To specify some particulars, we may observe that the eyes of fowls are distinguished as pearl or grey eyes, and gravel or red eyes, of various shades. Some fowls have crests of feathers instead of combs. The Poland crest is large and round, hanging almost over the eyes. A lark crest is narrow, and falling backwards; but although Mr. Dixon honours lark-crested fowls as a variety, we think this crest is nothing but an accident from some distant cross with Poland-crested fowls. A muff, or beard, is a bunch of feathers hanging from the lower mandible. Many of the Poland sub-

varieties have it; and we cannot recollect ever having seen it on an uncrested fowl. Whiskers need hardly be minutely described. In poultry, they consist of tufts of feathers standing out from the cheeks. There used to be a kind of fowl, called the Russian fowl, in which they were the chief characteristic; and they are also seen in some kinds of Polands.

The wing of a fowl is divided into various parts. The primary quill or flight-feathers are those which grow on the last joint of the wing. They are ten in number, are the main instruments of flight, and those which we consequently shorten, to destroy the balance of power, when we wish to check the licentious wanderings of my lord or my lady. The secondary quills grow on the next joint of the wing, are shorter than the primary, and are those which are most seen when the wing of the fowl is closed. We believe there are thirteen of these. The wing of a bird, in its skeleton, has been not inaptly compared to the skeleton of the human hand. The joint, representing the thumb, is set with three additional smaller quill feathers, which lie down over the first few primaries in an uncommonly neat arrangement. In the Hamburgs, the spots or spangles on the secondary quills, and those on the first range of the greater wing-coverts, form the bars so much insisted on by judges. The greater wing-coverts are the first few ranges of feathers which lie in order over the quills; and the lesser wing-coverts are the feathers of smaller size and softer texture, which finish up the wing, and pass round its edge so neatly. The under side of the wing is covered with soft feathers, also arranged in beautiful order.

Legs (familiarly, the shanks—learnedly, the tarsi—the part between the knee-joint and the foot) may be clean (or, in other words, without feathers), feathered (with a stripe of feathers down the outside), or booted (entirely covered with feathers). Sultans, or Serai Tä-ooks, Ptarmigans, and some Bantams, are booted. Shanghaes, Brahmas, Ghoon Dooks, and two or three other kinds, are feather-legged. Spanish, Dorkings, Game Fowls, Hamburgs, and most Polands, Sebrights, and black and white Bantams, are clean or plain legged. Some feather-legged and booted fowls are abundantly feathered on the feet also.

Vulture or falcon hocks are tufts of long feathers, standing out from the hocks.

The tail-feathers are the fourteen stiff ones of the tail. The tail-coverts are the softer curling feathers which hang over these. We believe there are, properly, only two (the centre two) sickle feathers, which are really tail-feathers; the others are tail-covert feathers.

Dubbing—generally, only applied to game-cocks—is cutting off the comb and wattles.

We may mention, that Spanish fowls are, perhaps, the most profitable to keep, provided the owner is lucky enough to have some that may turn out very excellent; but there is uncertainty in this, as fowls breed somewhat at random. There is great difficulty in getting first-rate Spanish fowls, even at a very high price; and there is no certainty that first-rate fowls will produce first-rate chickens. The latter are, besides, delicate to rear, the handsomest being generally the most tender. If you stoop to the now vulgar consideration of the merely useful—eggs and fowls for eating—there is no particular fault to be found with Spanish fowls for the table (especially pullets): they lay a respectable number of the finest eggs which the poultry-yard can produce; and, as to appearance, a little lot of Spanish fowls, in high condition, is no contemptible ornament to the pleasure-ground of a nobleman. High condition is that state of exuberant health which will make almost any fowl handsome and ornamental. It shows itself in the clear beaming eye, and the ruddy comb (according to the time of year); a feeling in the flesh, firm yet pliant; a good covering of meat upon the bones, but not too much fat; and last, not least, crispness and resplendence in the plumage—over which the bird, in fine condition, has as complete control as he has over his *other limbs*. When a bird is out of condition, the eye looks dull, the flesh is puffy, hard, or absent without leave, and the plumage entirely without gloss. You could not draw a feather without tearing the fevered skin. We speak now of condition, because it is a thing especially to be observed, if you buy Spanish fowls or chickens. Without attention to this, the smart new hen-house may soon be empty again; and perhaps you will blame the species, when you should find fault with your ill-conditioned purchase. To know the points of a Spanish fowl, study what

we have already said of the cock of that species, and get a bird as near to the description as you can; add a couple of black hens, of a cheaper sort, to lay eggs for family use; and the chances are, you will make a better start in Spanish than you would do if you bought a dozen hens and three or four cocks, hap-hazard, at high prices, and turned all in together to fight it out. The price of tidy Spanish fowls varies from £1 upwards. Dorkings are nice, motherly, good-looking fowls; and first-rate specimens fetch high prices: they are only tolerable layers, but the eggs are large and delicately flavoured. As fowls for the table they rank A 1; and, in this particular, are popular with poulterers, almost to the exclusion of all other kinds. The chickens are delicate, and so difficult to rear, as to prove disheartening to the most experienced amateurs. You may get good Dorking fowls at 5*s.* each; but, if anything superlative is desired, prices run up much as in the Spanish.

The accusations brought against Cochins is, that they eat more than any other kind of fowl, and have a continual propensity to incubate. On the other hand, they are tame, tractable creatures, and very good fowls to have where a high fence would be unsightly, as an altitude of four feet is sufficient to keep them in. They are capital layers—a quality often more important than any other to amateurs, who are anxious to begin to keep just a few fowls, chiefly with an eye to the luxury of new-laid eggs. Malays are well worth attention; they are very good fowls, besides having the advantage of being somewhat handsome.

Brahmas have all the merits of Cochins, without their faults, and are as handsome as Malays. Cochin-China fowls may be bought for from almost nothing up to £5 each; very good birds from 10*s.* to £1 each. Pretty good Malays may be bought for 10*s.* or 15*s.* each; and Brahmas at prices varying from 10*s.* to £2. In trying to give those who purchase fowls for the first time, some idea of their prices, we take those of the usual run of good birds. There is but one first-prize pen of a sort in every show, be it remembered: if, therefore, you want first-prize birds, you must be prepared to give the price which the owner sets on them; for the same reason that makes it necessary to give more for pearls than for pebbles—because they are less plentiful.

Three varieties of fowls come next, varied and equal in beauty, and all very ornamental and very good layers—Hamburgs, Polands, and Game. If you try the first, you may chance to see your fowl perched on the top of your neighbour's chimney, with an evident intention of extending his travels—a position of your vested property at which you will feel rather annoyed. If you try Polands, all the young chicks may die in rearing; and if you devote your attention to Game fowls, they may take a sudden freak of animosity, and peck out each other's eyes before you are up some morning. With these little drawbacks, they are all really good and beautiful fowls: only, if you try Hamburgs, take care that your fences are high enough; if Polands, bestow especial care on the young chickens while they are fledging, and for some little time afterwards; and if Game, do not let them get to fighting—*if you can help it.*

Tolerable Hamburg and Game fowls will cost from five to fifteen shillings each, and Polands from ten to twenty.

Where there is scarcely room for common-sized fowls, or for the large varieties, a few Bantams may be kept. They will always look active and pretty; and the eggs, though small, are deliciously delicate. Pretty Bantams may often be bought for a very few shillings.

The next thing to the price of the fowls, is where to buy them. We have a prejudice against buying at auctions; because we do not think owners would allow birds, likely to do good service to the purchasers, to go for so much less than they can get for them either at home, or by selling them through the medium of a respectable dealer. The best plan is, either to go to a reputable tradesman, or to an amateur, and see and choose the birds at home. Another good way of making purchases is by going to the poultry-shows. There the beginner can *look* well at the prize birds, and *choose* the cheaper ones which are most like them. We do not recommend a great outlay *to begin with.* Buy fowls at a moderate price; see what good you can do with their chickens; gain experience; *and then* spend a large sum, and get first-rate fowls if you feel disposed to do so.

There are many amateurs who would like to have handsome, productive fowls, but who care little about the fancy. We think they might, with great advantage, turn their attention to systematic crossing. We are as great an enemy as the most fastidious fancier can be, to turning in a lot of different fowls hap-hazard; but we believe judicious crossing may give excellent results in producing fowls which shall be very hardy, fine for the table, and abundant layers. The experimentalist has an almost unlimited field; let him only mark the merits of different varieties, and study to unite, reproduce, and continue them.

Let a Malay hen run with a Game cock; set the eggs, and save the pullets which are hatched from them. Match these pullets with a good stout-built Spanish cock, and the chickens will prove brilliant in plumage, very hardy, excellent for the table, and will lay four days out of five for most part of the year.

Brahmas and Cochins would be valuable in crossing, to produce hardihood and size. A touch of the Game gives delicacy of flavour to both fowls and eggs. The good properties of almost every kind might be turned to profitable account.

"The great point of selection," says Mr. Richardson, "is the breed which it shall be determined to keep; and this must be mainly decided by circumstances. The wealthy amateur may do as he pleases, but a different rule must be the guide of those who make poultry-keeping a matter of business. A few words of advice shall be hazarded.

"Both for appearance and for profit's sake, it is advisable that the farmer should confine his stock to *some one approved breed.* To retain several breeds in their purity, requires more personal attention, hired labour, and choice of out-buildings, than he can usually afford. It is best managed by such country gentlemen as have three or four lodges belonging to their park, at each one of which a distinct set of fowls may be maintained, and another or two quartered upon the gardener and the game-keeper, if the former official will submit to be plagued with them. In this way things will go on satisfactorily, especially if the people can be brought to take an interest in their charges, and perhaps to feel a little rivalry as to whose set is the best managed. A large farmer may often attain the same object by making a like use of the cottages of his workpeople. But that is not the thing which *he* requires. Pure chickens may be had from fowls that *usually* live together in miscellaneous socialism, by secluding the intended parents in an airy out-building, and rejecting a few of the eggs first laid by each hen. This plan requires constant attention and a pitiless hand, to clear off the many good-looking mongrels that will be constantly displaying their new-fashioned charms in the yard. The farmer had better decide to keep *one pure breed only* of cocks and hens, especially now that pure-bred fowls often fetch such extraordinary prices.

"If it is asked to determine *which* variety shall be kept, the counsel given must be accommodated to what the farmer *wants.* Are eggs greatly in demand in his neighbourhood; and does he wish to be spared the expense and trouble of rearing many young birds? Then let him take some of the non-sitting breeds. At the head of these stand the Black Spanish fowls, and their sub-variety, the Andalusians; next come the Hamburgs—the races that are so highly prized in the midland and northern counties—*i.e.*, the Bolton Bays, the Bolton Grays, the Silver Moonies, and the Copper Moss fowls, according to the numerous local *aliases* of the four sub-races. Last in profitableness among the non-sitters, though not in beauty nor in excellence of flesh, are the Polish fowls. But the Spanish fowls are larger birds, and consume a good deal. It is true that their eggs are of proportionate size and excellence; but, in the market, an egg is an egg; and we believe that greater *numbers* will be obtained, at the same cost of food, by adopting one of the Hamburgs as the established colonist of the farm-yard. We therefore beg leave to take the Bolton Bays, or Golden-pencilled Hamburgs, by the hand, and introduce them to the favourable consideration of the farmer and his amiable consort. Whichever breed of non-sitting fowls is selected, the *stock* must be annually kept up by sending out eggs to the neighbouring cottages to be hatched, and paying, for all reared, a certain amount of head-money, at an age agreed upon.

"If, however, eggs are not the principal desideratum, and Madam has the leisure and good-

will to see to the rearing of numerous broods; if she has also three or four rosy-cheeked sons and daughters to assist her in the amusement, besides a boy and a maid to do the heavier work—then let one of the often-incubating breeds be destined to people her barn-door paradise with the philoprogenitive set of inhabitants. She may honour the Dorkings and the Surrey, or the Game fowls, or the Cochin-Chinas, with her preference. There cannot be a better sort for the farmer than the race of Surrey fowls, known as Cuckoo fowls. They are somewhat dull and quaker-like in plumage, and inactive in their movements. So much the better: the fowl-stealer cannot spy them out so well in the dusk; and they fatten famously, besides being good layers, sitters, and nurses; and, in short, possessing every gallinaceous virtue. Game fowls are more beautiful, and are equally good *parents;* their flesh, too, is delicious, but wants the weight of the Cuckoos, and is apt not to dress so white for market. The cocks, as they grow old and jealous, are very prone to kill the other male inhabitants of the poultry-yard, such as turkeys, guinea-fowl, and even drakes, if they fancy themselves insulted by them. They are more suited to the lodge, the dog-kennel, the coach-house court, or even the cottage *orné*, than they are to the farm-yard, to which quiet place, when very good, they are apt to give a sort of sporting character. It must be confessed they are often birds of great beauty; but the Cuckoo fowls are much more business-like. The Cochin-Chinas, even yet, are more in the hands of wealthy amateurs and exhibitors at poultry-shows, than available for farmers as a *main crop* of fowls. The prices asked for specimens that have been cried-up by fanciers, are altogether unprecedented, and will be quoted hereafter, in histories of the present times, as instances of the lengths to which a popular mania will go. Still, some farm-yards are peopled with them; and the effect is good, whilst the result is highly satisfactory."

CHAPTER IV.

SELECTION OF STOCK; INTERBREEDING; EGG-BUYING; HATCHING; FEEDING; FATTENING; HOUSING.

Among the earliest authorities we have on the subject of the breeding and management of poultry, is Columella; but besides him, there is something to be found in Cato, Pliny, and Varro; but all may, substantially, be considered as entertaining similar views. Columella is, however, the grand source of poultry antiquity; and, in our day, by the writers on this subject, he is mostly quoted at second-hand. Gesner made a collection of passages relative to birds; but Aldrovandi was, in his time, the exhaustless mine of all that was known on the subject. Considering the immense mass of his materials, this ornithologist arranged his matter in marvellous order; but his discrimination was much less than his patience; and his judgment was, perhaps, less than either. We are not aware of there being an English translation of him; therefore his voluminous treasures have not yet fallen into the coffers of every literary artist. To the common fowl, alone, he devotes one hundred and forty-six pages of his folio, opening his subject with half a page of preliminary matter, and then entering on his ambiguities touching cocks and hens. Then comes his *Synomnia;* followed by his account of the different kinds; which is again succeeded by a general description of the cock and hen, replete with learning. *Amatomica* is the heading of the next section; followed by the natural history of their mode of increase up to hatching. This comprises the growth of the egg, the progress of the chick during incubation, &c., with a vast deal of mosaic work in the shape of truth and falsehood, sense, and nonsense, on the breeding of these creatures. We

have then six pages on the food of chickens, succeeded by a number of separate sections, with which we have here little to do, but which remind us that what we have indicated in this brief review, is introductory to a large portion of the subject of this chapter.

Returning to Columella, we find that he allots twelve hens to one cock. Since his day, however, polygamy, even in the poultry world, has been less fashionable. In the *Farmer's Director*, by Bradley, one cock is to be satisfied with seven or eight hens. The same number is recommended by other breeders, of equally abstinent principles. These, however, are English breeders. On the other hand, Parmentier, a French writer, assigns fifteen, or even twenty hens to one cock, provided he be young, vigorous, and healthy, which, in our humble opinion, he would need to be. Bosc, another French writer, says that it is only in spring that a cock should have fewer than twenty hens; but as the Gallic bird may have more vigour in him than the Saxon, we will not stay to dispute his opinion. Our own Dixon sensibly says, that the hens allowed to one cock, should vary in accordance with the object in view; but it is the opinion of Mr. Nolan that in order to secure a prime breed, a cock two years old should not have more than five hens. Breeders of game fowl for combat limit the number to four, or, *at most*, five; their object, of course, being the production of strong chickens. In winter, or in cold or damp weather, Mowbray says, a cock should only have four hens.

Even from these high authorities there are dissentients, who say, that if fowls are kept chiefly for the sake of the eggs, for domestic purposes, ten hens, or even more, may run with one cock; and some of our best judges affirm, that it makes no difference in the number of eggs produced, whether a cock is kept at all or not. If, therefore, it is thought advisable to avoid the expense of keeping a gentleman, a few eggs for setting can be bought, begged, or exchanged. In the case of the cottager, the keep of one hearty fowl, to be set off against the produce of the sale of eggs at a penny or twopence each, may be worth consideration. When fowls are kept with a view to rearing chickens, we think no more than four hens should run with the cock. If a fine, healthy, well-fed bird is allowed to run with four fair ladies only, the owner may fairly expect every egg to prove productive; that is to say, after the danger of the chills of the early season is past.

It is impossible to be too careful in keeping choice hens from the intrusion of any male bird except the one which it is wished to have as sire to the chickens. We know so little of the intricate rules of good breeding, that we entertain a prejudice against brood hens mixing even with *hens* of different kinds, especially with fowls of colours which would be objectionable in their chickens. Authorities too high to be doubted, affirm, that one stallion will influence not only the one foal, but those which the mare may have in after years. We would therefore keep choice pullets away from other fowls from *chickenhood*, and never, *at any season*, allow them to mix with either cocks or hens of a different breed. In assorting the fowls, care should be taken that both cock and hen have not the same fault or deficiency. Too many beauties and perfections they cannot have.

"If you look to the production of eggs alone," says Mr. Richardson, "one cock—if a stout, young, and lively bird—may have as many as *twenty-four* hens. If, however, you want to obtain strong and thriving chickens, you must restrict them to six at most. If your object be the improvement of a worn-out and degenerate breed, the fewer hens you allow to one cock the better; and you should not, under these circumstances, allow him more than *three*. But whatever the breed selected, or the object in view, the cock should be *in perfect health*."

Having, we hope, got over this difficulty as to the number of ladies to be assigned to the Spanish gentleman in black, or any other gentleman, however gaudy may be his colouring, we trust we shall be able to pursue our subject without much interruption from the diverse opinions of opposite parties.

In reference to breeding, if the object in view be strength of constitution, it is a maxim with many, that there is nothing like breeding from two-year-old fowls on both sides; but if great weight is given to beauty and points, it is doubted whether it is not better to pair a one-year-old hen with an old bird. Without

attempting satisfactorily to solve the problem ourselves, the following has been proposed by one of the most eminent amateur breeders of the present day :—"I should very much like to know what experienced breeders think of the three following cases, and from which they would expect the chickens to turn out best :—No. 1. A two-year-old cock with a hen : No. 2. A one-year-old cock with a two or three-year-old hen : or No. 3. A two or three-year-old cock with a one-year-old hen." The same gentleman thinks that, for his first breeding season, the young cock should have only two females.

When a hen gets broody, there is no danger of mistaking her meaning. Sometimes she fusses about the yard, with tail set and feathers erect, like an angry turkey-cock. Sometimes she establishes herself in a nest, and, with great avidity, takes possession of any egg which may be there. It is a curious sight to see a broody hen carry an egg. She takes it up under the chin (if we may be allowed to speak of the chin of a hen), holding it carefully against her breast with her beak ; and so we have known it conveyed to some little distance, and over a low partition. As no sentimental idea of *meum* and *tuum* influences sitting hens, it will not do to set them side by side without a partition between the nests ; for the hen gifted with the largest bump of acquisitiveness, will be continually pilfering eggs from her neighbours ; in process of which manipulations, some eggs will get broken, others chilled, and, in others, the germ of the chick, very tender during the early period of incubation, will be deprived of life.

After health and strength have been duly considered, the next grand object to enter into the calculations of the breeder, is the age of the birds. In the selection of the cock, he should be neither too old nor too young, but running from one year and a-half to three years and a-half. Some vigorous gentlemen, of good constitutions, retain their power till they are even past six ; but these are not to be chosen for breeding purposes ; nor are those young *fellows*, whose premature amative propensities are developed so early as the age of five or six months. It is, in every proceeding in life, safer to rest on a certain than an uncertain basis ; and this principle holds good in poultry breeding, as well as in matters of greater importance : therefore, the best plan to pursue, is to obtain a strong healthy bird, in the very fulness of his prime, and so avoid such premature developments, which are always deceptive, as well as the infirmities of age, which, although existing, may not be so readily detected. Extremes are, at all times, dangerous.

As in all fowls, except Brahmas and Cochins, it is a doubtful experiment to move a broody hen, it is best, as soon as a fowl gives warning to sit, by remaining long on the nest for laying, to give her a movable one, which will do for the purpose. If she should steal a nest in a hedge, or any out-of-the-way corner, it should be considered as desirable. If she choose one in the hen-house, most hens will bear moving, nest and all, to a quiet place ; but a great many will not like to be taken out of the chosen nest, and placed in another. The brooders should, if possible, be placed where they cannot be interrupted or annoyed by other fowls. Food and water should be put near them, that they may come off and eat when they feel the desire, which will be once a day. Give them gravel as well as food, and some dust to roll in and clean their feathers. A person should be on the watch to know when the hens leave the nest, to see that they do not remain off too long, or get to fighting, and that each one returns to her own place. Most hens remain off from five minutes to twenty.

Sometimes annoyance will be caused by the pugnacity of the cocks. This is said to arise from their temperaments having a large infusion of the amorous element, which causes a great jealousy of disposition. Mascall, or rather his original, Columella, recommends, as a cure for this, that we should "slitte two pieces of thick leather, and put them on his legges ; and those will hang over his feete, which will correct the vehement heat of jealousies within him." This direction is approved by M. Parmentier, who adds, that "such a bit of leather will cause the most turbulent cock to become as quiet as a man who is bound both hand and foot."

Dorkings are better sitters than layers ; whilst Spanish fowls reverse this order ; and these conditions will be found to be pretty generally characteristic of hens partaking of the prevailing colours of these two varieties respectively—the black usually being the best

layers, and the grey or chequered hens, more particularly those with light-coloured legs, the best sitters.

When a hen is anxious to sit, she intimates her desire by a peculiar kind of cluck, which she continues, even after hatching, and until her brood no longer require her motherly care. At this period the heat of her body is materially increased, which, no doubt, generates an uneasy feeling, should it not be drawn off, either by the gratification of natural desire, or by artificial means. Should she not be desired to sit, a common practice for allaying this heat is immersion in cold water; but to place her in her coop, in some cool, quiet spot, where she may look out upon the grass, is a much more humane method of proceeding.

Should doubts be entertained as to the steadiness of the hen required to sit, she should be tried for three or four days, by having her placed on several eggs of little or no value. If chickens are desired to be hatched by some particular time, and there are no hens *clucking*, or ready to sit, the desire of incubation may be excited by stimulating food, such as oatmeal porridge well boiled, seasoned with Cayenne pepper; toast, or dry bread, steeped in good ale, or hard-boiled eggs, and fresh raw meat cut small. The practice of plucking the feathers, or using nettles, is a bad one, and far less efficacious than cruel.

There are some hens as constant in their sitting as those we have been describing are the reverse; and birds possessing this temperament will frequently sit until they half-starve themselves, if not prevented. Mr. Lawrence says, that he has had hens which, under these circumstances, reduced themselves to such a pitch of weakness as even to *faint;* and, after the chickens were hatched, to be so weak as to be scarcely able to attend to them.

Quoting Mr. Richardson, in a previous page, we have observed, that the great point of selection is the breed which it shall be determined to keep, and that this must be mainly decided by circumstances; that the wealthy amateur may do as he pleases, but that a different rule must be the guide of those who make poultry-keeping a matter of business. This should always be borne in mind. We recommend the farmer to confine his stock to *some one approved breed.*

INTERBREEDING.

Whilst remarking on the selection of the breed, we would observe, that in poultry, as well as in all other classes of animals, an infusion of different blood, so to speak, is necessary to improve or prevent a degeneracy in the stock.

For exhibition purposes, it has been allowed that cross-breeding is of no avail; but holding the opinion that the exhibition of birds is only a *secondary* consideration, when compared with their *commercial utility*, a good *primâ facie* case may be made out how cross-breeding is likely to be advantageously and profitably pursued without interfering, in the slightest degree, with those whose tastes confine them to the production of pure-bred birds.

The two great points to be desired in poultry, are the increased production of eggs, and its own improvement for the table. These are, perhaps, the only legitimate grounds on which we can justify ourselves in entering upon cross-breeding. If either one or the other of these can be obtained, it follows, as a matter of course, that a great benefit will be conferred, especially upon those who keep poultry when the latter may be made to help to keep them. That judicious cross-breeding does *materially improve* the value—that is, the marketable value—of many animals, is a well-established fact. For example, a pure Southdown or Leicester sheep is exceedingly valuable, but a cross between the two is more valuable still: the meat not only brings more per pound in the market, but the quality of the wool is materially improved; while hardihood and early maturity are not to be forgotten as important considerations arising from this excellent cross. Besides this argument, the *cross* will live and fatten, where the pure-bred will starve and die. The same argument holds good with cattle. Many of the cross-breeds make what is called "the best butchers'" beasts. If such *is* the case, why may not poultry, judiciously crossed, produce the most profitable varieties? And that they will do so we have not the smallest doubt.

To combine quality with size, of course, is the great desideratum in table poultry. From observation in such matters, the best birds to *start with* are, perhaps, a cross between Cochins and Dorkings. A good cock of the first

variety, not above three years old, should be selected, and mated with six first-rate Dorking hens of a year old. The *pullets* of that cross should be mated the next season with Game, and their produce used. It is not recommended to breed from them again on any consideration, as it cannot be done to gain any point of excellence. By the above crosses all the essentials of a good fowl are obtained. In the first place, size is obtained from the Cochin, and one good cross of quality from the Dorking. By the Game cross very little in size is sacrificed, whilst another first-rate cross, in point of quality, is added. We have seen birds of this cross attain first-rate and rapid weight, and, when killed, retain nothing of their Eastern origin, except that peculiar juiciness for which they are remarkable—the flesh being as white as snow, and as savoury as any aldermanic *gourmand* could desire. We believe that this cross cannot be improved upon for table purposes. We have seen the above first cross, crossed with Malay instead of Game; but it may easily be conceived it was a mistake, as the Malay cross was going too much back to the Eastern type, without giving any counterbalancing advantage.

It is great folly to breed further than one cross; or, in other words, to mate cross-bred birds together, as it has been found that the further we get from the first cross the more we are disappointed.

In crossing, it is much easier to produce increased value for the table than increased egg-layers. Indeed, we do not think that any amount of crossing can produce birds which would, in laying, beat some of our present known favourite varieties; therefore, on this head, it is unnecessary for us to enlarge.

If, by cross-breeding, additional size and superior quality can be obtained, it is, to a certain extent, worthy of carrying out—not that we would, on any account, advocate it in the fancy, but it might be the means of supplying our markets with an improved variety of domestic fowl, with a profitable return to both breeder and feeder.

An anonymous writer, who has evidently had great experience in animal-breeding, remarks —"I have bred *in-and-in* from almost all varieties of pigeons, rabbits, pigs, canaries, and numerous varieties of flowers and vegetables: in each and every case I found that, for the first few generations, they improved, and finally degenerated: in animals, invariably, diseases of the head are prominent; in flowers and vegetables it produced general delicacy. This is forcibly exhibited in some of our favourite flowers; many of the pet roses are useless on their own roots, and we bud them on the healthy briar, which man has not tampered with. I am often, almost daily, in company with short-horn breeders. A common complaint is, of the barren heifers and bulls. I make no exception in their case; I would cross them with the West Highland cattle, and so fulfil our trust and duty to posterity by saving to them a breed which the present system of shows is encouraging all breeders to render degenerate.

"So long as man confines himself to the species, and does not breed too near akin, he will be successful in producing useful animals, especially in the first cross; but it is against nature to decrease the natural size of any animal's head. It is against nature, also, to see a four-year-old heifer standing on four legs that would well become a full-bred yearling colt. In a recent instance I measured a prize four-year-old heifer, 95 stone weight, and a yearling Flatcatcher: the former I could span, the latter not. As responsibility rests upon all show committees, it would be well for them to consider it. A few years ago, cottagers, about me especially, cried out for something with a little more "*blood*" when buying their pig: now the complaint is the reverse."

EGG-SELLING, AND BUYING.

We have frequently heard great complaints made about bought eggs; and we have often thought that two reasons may account for the disappointment complained of. Those who sell the eggs are careless as to what they sell; and those who buy them expect better luck than it is in the power of eggs to command.

In selecting eggs for sitting, it should be borne in mind what are the number of hens the cock should associate with. Those of the average size, laid by that particular hen, are most likely to prove productive. The oft-repeated notion that round eggs contain female chicks, whilst long ones produce cockerels, has been refuted over and over again.

Those who sell eggs for incubation, unless they are usually *themselves* on the spot, to see that every circumstance connected with the transaction is properly conducted, had better keep but one kind of fowl in one locality. As the eggs are laid they should be put by in a box of chaff or bran, with memoranda to state the date when each was laid, the kind of fowl, if different varieties are kept, and the particular hen that laid each separate egg. Eggs more than three weeks old should not travel, as the fresher they are the better. When amateurs have eggs to dispose of, we think it is best to advertise them; and we decidedly recommend pre-payment to be made a condition. To pay for a dozen of eggs which were set weeks ago, is a trifle which *may* escape a person's recollection; although, perhaps, it ought not to do so; and, therefore, we recommend pre-payment to be made a condition in all such sales. Eggs are sold now at more moderate prices than they fetched some years ago; and numerous letters, to jog the memories of backward payers, become a discount rather more than should be allowed on each sale. Many persons who forget to settle trifles of this kind, do so quite unintentionally. If, therefore, amateurs generally made pre-payment imperative, we believe it would prove an advantage both ways. Dealers cannot do this: those who run long accounts with them, and other tradesmen, neglect to calculate the magnitude of the spreading evil they create by doing so; but amateurs, to whom we may reckon selling a matter of less importance, *can* take the law into their own hands. No one ever yet sold eggs for hatching, without having some complaints, and demands for more eggs, in place of those that have proved unproductive. Whether these demands should be acceded to, must, of course, depend on their apparent fairness. We think those who sell eggs should never promise to make up loss or failure; but many would wish to do so under certain circumstances.

Having spoken of selling, we may say a few words upon buying eggs. In this case we can only depend on the known character of the amateur, or the dealer, from whom we purchase. By holding the eggs in a strong light, we may ascertain, by the size of the air-bladder at the large end, whether the egg is fresh; and this is about all we can do beyond placing reliance upon the seller. In fairness, we must give the eggs a good chance, by having them immediately placed under a good hen, in a place where her sitting cannot be disturbed by other fowls, or entities still more mischievous. If the chickens are in the proportion of two to three, or even to four eggs, we may reckon that we have been well treated, and lucky into the bargain. If it were intended to establish a stock by purchasing eggs, the best plan would be, to buy sittings from different breeders; to bring the chickens up apart; or to place such marks upon them as should distinguish them as they grow older, and then to mate the cocks from one stock with the hens of another. The objection to this plan is, that the fowls, the next year, when their owner would wish to breed from them, would be all young alike. A better plan would, therefore, be, to rear pullets in this manner, and in the autumn, or following spring, to purchase a good mature cock. Then, the owner would at once be in a position to breed fine chickens.

"Caution," says Mr. Richardson, "is necessary in the purchase of eggs for sitting, especially from strangers and from a distance. Mr. Punchard has demonstrated, that skill in the packing of eggs is well bestowed, and that the average amount of productiveness of travelled eggs, may be greatly increased by the way in which they are sent out upon their journey. Much, however, must always depend on the manner in which they are treated in their transit by railway porters and other officials. In the county court of Lynn, Norfolk, an action was, on one occasion, brought to recover the sum of £4 10*s.* 6*d.*, the value of thirty-six Cochin eggs which had been sent by the plaintiff from Penzance, Cornwall. The box not arriving at the time it was due, he sent to the station to enquire, and was told by one of the clerks that it had not arrived; but on a search being instituted, the box was found in an open shed, exposed to frosty weather. Hens, and Cantelo's incubator, failed in producing from them a single chicken. For the defendants—namely, the East Anglican Railway Company—it was argued that the action had been brought against the wrong parties. In order to recover damages for loss, the plaintiff was bound to show that vitality existed in the eggs when they

were brought to the station of the company. The box had been under several conveyances—by steamer from Penzance to Bristol, and from Bristol to Paddington by the Great Western, whence it had to be conveyed over the stones, from Paddington, to the Eastern Counties station; and it did not come into the jurisdiction of the East Anglican Company until it arrived at Ely. The judge said that he could not conscientiously see that it had been proved that there was any vitality in the eggs when they arrived; but there was clearly a wrong, on the part of the company, in not delivering the goods as soon after they arrived as possible. The plaintiff was, therefore, nonsuited, without costs on either side. In short, it was discovered that all the law in the world could not bring the addled eggs to life again. Other confiding purchasers of Cochin-China eggs have found that their beautiful chesnut tint has been the result of skilful dyeing."

Eggs for hatching should be preserved by placing them, with the small end downwards, in sawdust, bran, sand, wood-ashes, or any other substance which will form a soft bed, and, at least, to some extent, exclude the air. If, however, the object is to preserve them for a considerable length of time, with the view that they may be eaten, they should, when newly laid, be dipt in oil, or warm—not hot—pure hog's-lard. The greasy substance should be rubbed with the fingers into the pores of the eggs, and then they should be packed, with the *broad end upwards*, in a box or barrel. If they are to be exported across sea, a coat of varnish might be tried upon them; but if they are intended for hatching, all these extraneous substances must, as a matter of course, be removed. In packing them, care should be taken that it be compactly done, so that as much shaking as possible may be prevented. For this purpose various modes are adopted. Some pack in hay in a crate, and others in hay in a hamper. Baily, the great breeder, packs in a crate of hay, and Baker in a hamper of hay. Both plans are good; the chief thing being to give the eggs plenty of room, so that the bumps and thumps of outrageous fortune they are pretty sure to meet with in the railway transit, may not injure them. Some persons pack in a box, with chaff, or in oats; and others tie a wisp of hay round each egg, and fill in the interstices with any yielding commodity. After packing carefully, the owner can do no more than have the package safely conveyed to the railway, and consigned to the mercy of the officials, which we fear is frequently of a somewhat rough kind, considering the fragility of the article entrusted to their care.

HATCHING.

Regarding the number of eggs to be placed under a hen for hatching, from nine to eleven is usually chosen. Much of the ill luck attending hatching is caused by setting too many eggs under one hen. Nine eggs are sufficient for any hen—of course we mean Spanish eggs. The result generally proves this to be so. We all know that the eggs of our prize fancy fowls, which are, to a very great extent, brought up artificially, do not hatch so well as those of commoner kinds. May it not be that the germ in the egg is far more delicate, or, properly speaking, *weaker*, and requires greater warmth to give it life? This is, however, dependent on the size of both eggs and hen. An *odd number* is preferred as better adapted for *covering* in the nest. Be sure they are fresh. During the early period of incubation, hens will sometimes eat their eggs—a circumstance arising from their craving after calcareous matter and animal food, with both of which their appetites should have been satisfied previous to the commencement of incubation.

Never let a poor hen waste the anxiety of three weeks on bad eggs. When she has sat nine or ten days, try the eggs, and take away every one which has no chicken-germ within. It is easy to discriminate between the good and the bad eggs; that is, those that contain, and those that do not contain chickens. The manner in which this may be done is simply by holding them up to a good light; but the best contrivance is to make a round hole in the hen-house door. Should this not be convenient, make a hole in the bottom of a box, which will always come in handy for the same purpose, as it can be fixed up *pro tem.* against the window of the hen-house, or a lamp can be placed inside. The best size for the hole is $1\frac{1}{4}$ inches in diameter. This will furnish sufficient light to try Spanish fowls' eggs, and will do equally well for Sebrights. Have this apparatus close

at hand, where the hens have been sitting beyond a week. Remove the eggs from under each hen, and carefully guard against allowing them to be shaken, or kept away from the fowl long enough to get in the slightest degree cool. Hold each egg to the round hole, and the opaque germ of the chick will be quite perceptible, as well as the delicately-traced blood-vessels upon the shell, which are intended to nourish the embryo until they dry up at the expiration of the period of incubation—as a hint to the chicken that it had better issue forth, and scratch for its own living in this world of ornithological as well as human cares. Eggs which appear to have undergone no change must be removed. It is better to make up each nest to nine good eggs; and if any hens should, by these manipulations, be left at liberty, they may have fresh batches of eggs given to them. It will do no injury to any good steady sitter to remain in the nest thirty days, or even a *little* longer.

Except in this one examination of the eggs, which must be conducted in the gentlest manner possible, never interfere with the sitter.

The day before that day three weeks on which the eggs were set, especial care should be taken to notice the nest when the hen leaves to feed, and to observe if any of the eggs are chipped. When hatching-time arrives, the bill of the expanding chick presses up one spot of the shell, with starry cracks diverging from it. If there is no appearance of this kind, the hen may safely be left until the twenty-first day, as the chickens generally require no feeding for the first twenty-four hours. The chick, from this first spring in the shell, spreads the cracks by its own force alone, until it opens a door for itself. Then it lies, a little wet and weakly thing, beneath its mother's warm feathers for some time. When twenty hours old or so, it begins to eat. Then we think it best to place before the mother, in the nest, a tiny basin filled with moistened oatmeal or barley meal. We would give this in preference to a chopped egg, as some do, because most likely the mother will set to work herself, and devour that greedily; and if she does her duty, she is worthy of her hire; that is, her share (sometimes the lion's certainly) of the good food provided for the chicks. When this is gone, a chopped, hard-boiled egg, mixed up with stale bread-crumbs, and a little water, should be put into a very shallow pan, as the chicks soon want to drink.

"For about twenty-four hours after birth," says Mr. Richardson, "chicks not only do well enough without extraneous nourishment, but will be far more likely to thrive if let alone. The next day they may be fed with crumbs of bread and eggs, boiled hard and chopped fine. For the first four days they require food at least hourly, to supply the rapid increase in bulk and feathers. Damp is fatal to them. Small-grained oatmeal, given raw, or slightly scalded, and suffered to cool down to a very low degree of *tepidity*, will be found useful and good. Do not forget that, in all probability, thirst will be present before hunger; and there ought, therefore, always to be a flat, shallow pan, or plate of clean spring water left within reach; and the hen herself, glad of a little refreshment after so long a task, will usually lead the way to it."

For the purpose of breaking open its prison-house, and "seeing the light," one would think that there could not be any living thing in the world so ill adapted as a chick when about to emerge into life. Yet Nature, in her exhaustless powers of ingenious operation, enables it to do so. If the chick, however, be weakly, artificial assistance is sometimes necessary to give it the liberty it seeks. The position which it holds in the egg is such, as frequently to render it difficult for such a tender youngling to *break its way*. The neck slopes towards the belly, to about the centre of which comes the head; whilst the head reposes beneath the right wing. The feet are gathered up, something in the style of a fowl trussed for the spit; and the claws are bent backwards to such an extent as almost to touch the head. It is in this confined position that the shelly wall of the prison has to be broken through. Such is the position; and when we consider the hardness of the calcareous wall that has to be reached, we can hardly conceive anything more difficult for the accomplishment of a chick. "The process of effecting the breaking of the shell, is a succession of taps from the beak, by which first a crack or *star*, with many cracks diverging from it, takes place; a hole is soon effected; the sides gradually chip away, and the chicken enters into its new sphere of being.

Sometimes the little bird, on proceeding to leave the broken shell, unexpectedly finds itself retained in its place by some accidental or irregular circumstance. The shell may, for instance, have been well cracked, and yet its lining membrane may be so tough as to defy all the efforts of the inmate to rupture it, and thus still present a barrier—often, without assistance, an insurmountable one. Some chickens *waste their time* striving to tear this membrane before they have made a sufficient crack in the shell. These had better not receive assistance, as they will speedily find out their error, and go to work in a proper manner."

It is recommended that, in every case, the egg should be looked through before helping the chick. The chicken, which comes forth previous to the complete absorption of the yolk, is sure to be an unhealthy, delicate little thing, walking about like a gallinaceous ghost, ready to fall off its legs at every puff of wind. Before quitting the shell, a chicken ought to have imbibed such a portion of nourishment as will, at all events, support its existence for twenty-four hours afterwards. The yolk is designed for this purpose; and any excess of light that may be permitted to strike upon the egg, or any injudicious handling of it as the close of incubation approaches, will generally be the cause of inducing the chicken to strive to get out too soon, which, as a natural consequence, is frequently productive of considerable numerical loss. As every membrane or shell is not alike in point of thickness, another difficulty presents itself in preventing the chick from easily coming forth.

Dipping the eggs into warm water the day before (some poulterers think they will be pecked at), is a plan sometimes adopted; but, as this can produce no real difference upon the consistence of the shell, the plan may safely be pronounced futile. This practice has, therefore, been objected to. Too much heat is another obstacle in the way of the egress of the chick, as the albumen with which it is encompassed, sometimes becomes converted into a kind of *glue*, which fastens them to the extraordinary abode in which they are inclosed.

The only case in which interference can prove useful, is said to be—"When you find the fracture on the outside of the shell remaining the same for five or six hours, and when, on examining the edges of this fracture, you find them dry and unmoistened by any fluid, you may conclude that assistance is called for, and may proceed to render it with all possible caution. The best mode to be adopted, on such occasions, is to imitate, as nearly as possible, the natural efforts of the chicken itself, which may be done by sharp, short strokes with the back of a knife or key; or, what is better than either, the point of a pair of scissors. Be, however, both gentle, firm, and deliberate, and take care lest you penetrate the cavity of the egg. Having succeeded in making a sufficient opening in the shell, you may, by a careful and tender use of your fingers, extricate the chick. Sometimes a few scales of albumen, or of the lining membrane of the egg, may remain on the bird's plumage for some days. Do not be uneasy about them. Leave them alone, and, as they dry, they will fall off of themselves. In affording your assistance to the embarrassed chick, be extremely tender with your fingers. You may otherwise often kill when your intention is only to cure.

"For my own part," continues the same authority, "my confidence in the unassisted powers of nature is such, that I should be disposed to permit, at least, *eight hours* to elapse before I resorted to mechanical means of interference. A chick so weak as to perish before that time, is not worth striving to extricate; and, on the score of humanity, its death within the shell will be less painful than after quitting it."

When the chickens are all hatched out and dry, we think it a capital plan to move the mother and her family into a clean warm nest, because the one in which she has been sitting will most likely be infested with hens' fleas; and if these get into the young brood—for they love to prey on the young—the evil will be great. In this the chicks may remain over the second or third day, according to their strength, and the state of the weather.

In reference to the vermin "pest," affecting the chickens, two anonymous writers supply the following statements and suggestive remedies, or preventives:—

"Last year my chickens, as also those of

my neighbours, were attacked with lice on the head, which destroyed numbers of them. This year some of my neighbours have the scourge again. When I set a hen, she has always the opportunity of getting a dust-bath whenever she comes off her nest. This she had also last year, and she was, and is, removed to a fresh pen after hatching. The plan I have adopted this season is, before giving the hen her chickens, to dust her well with flour of sulphur under her wings, on her breast, and under her feathers: it can do the chickens no harm. As yet I see none of my former enemies. My houses were perfectly clean last year, as they are this."

"To insure a sufficient amount of moisture, when it is found necessary to set the hen in a spare hay-loft or room, with a boarded floor, I would recommend a plan which I have found, so far, to answer well this season—viz., to place beneath the box in which the hen sits, a piece of matting or carpeting which has been exposed to a good shower of rain. No doubt, the ground is the best place on which to set a hen; and, at this season of the year, it should be in-doors; but it is not every one who has such convenient places, where the kindly-intentioned visits of other hens, adding to the store of eggs for incubation day by day, can be avoided. It would, perhaps, add to the comfort of the hen if, previous to setting her, a little flour of sulphur were dusted under her feathers. This would settle the vermin, which are a source of annoyance, not only to the mother, but to her young progeny. I have found young chickens infested with them, even when the hen, in summer, had sat under the hedge of my lawn, where she had every opportunity of dusting herself."

When chickens are hatched during cold weather, they require artificial warmth, or, at the very least, comfortable housing; and the kitchen of a farm-house affords this in the utmost perfection. Freedom from annoyance, commodious and warm housing, and a sheltered walk, are all that they require. It ought always to be borne in mind, that the dangers which are most likely to prove destructive to the hopes of an amateur in rearing his broods, are wet, cold, bleak winds, neglect, short commons, cats, rats, hawks, and vermin of all kinds. If a hen is left at liberty with her brood, she leads them under shelter at the approach of rain; and many little bright eyes may be seen glancing from their safe retreat, and watching for the return of fair weather. By our interference, the exercise of this instinct in the old hen is often prevented. We place the coop, in the morning, on a warm sunny spot, where—with the addition of good feeding of course—we think they will be contented and happy for many hours. But, in the course of a few revolutions of the long hands of the clock, what changes may happen! The sun either leaves the place, or blazes on it with an intensity of heat enough to give the hen the vertigo; a sharp east wind springs up, and the poor little ones stand pinched and shivering in its blast; or a chilly rain comes on, and beats into the coop. The coops should be visited once an hour while the chickens are very young, and every two hours afterwards. The chickens should then be fed and supplied with clean water, and the coops shifted if necessary. At night, the hen and her chickens may be driven into the hen-house, and a slight shelter, according to the weather, placed before the bars of the coop. Constant attention and frequent feeding are indispensable for chickens. Cats and other hairy and feathered enemies will require unceasing vigilance, and, perhaps, a good gun. For these, too, the services of a well-trained terrier are invaluable; nor are good traps to be despised. With regard to feeding, it is with young chickens as it is with grown fowls—variety is best. Sometimes food of various kinds should be given them in one day; occasionally, a change of the kind should be made from day to day; and, in addition to all that can be given them, the hen should be allowed to roam at large for a little time every day, to seek for her progeny, ants' eggs, worms, &c., taking care to coop her again before she can over-tire the little ones. For the first week, there is nothing better to feed with than chopped hard-boiled eggs. The eggs which are removed from the nests of the sitters, within the first ten days, will do very well to boil for the young chickens.

After the first week, various other viands may be given. Perhaps the best plan for us to pursue here, will be to give a bill of fare. Barley-meal and oat-meal, moistened with water or with milk; grain broken in a mill;

boiled barley; pearl barley rolled in bran or pollard; pieces of meat and potatoes; bones, and any other scraps from the table; swelled rice rolled in bean-meal. Ship biscuit, hemp-seed, canary, buck-wheat, and many other things may be used occasionally, in small quantities, by way of a change.

Should the chicks be *very* weakly, they may be crammed with crumbs of good white bread, steeped in milk or butter, with well-minced, hard-boiled egg; but, at the same time, it must be noted that their little crops are not capable of holding more than the bulk of a pea—therefore rather *under* than *over* feed. If the hen has been much exhausted by hatching, it will do well to cram her with crumbs of bread steeped in port wine; or, in the absence of wine, diluted spirits or ginger cordial may be substituted. Such treatment, however, is very rarely necessary.

For hatching, warm damp weather is wanted. Nothing can be worse than an east wind, especially if accompanied with occasional bursts of cold rain, also from the east.

Sprinkling the eggs, now and then, has been recommended when the hen comes off to feed. For this, of course, warm water must be used. We once placed a little pan of water in a hen's nest, for her to drink from. This she cleverly upset, and gave the eggs a cold shower-bath, which killed all the chickens, or nearly all.

Whilst on this subject of hot and cold water, it will not be out of place to give an extract from Bechstein, which was written with reference to the fledging of young cage birds:—"It sometimes happens, in very dry seasons, that the feathers of the young birds cannot develop naturally. A bath of tepid water, employed on such an occasion by Madame ———, was so successful, that I cannot do better than recommend it." In another passage, Bechstein recommends that the young birds shall be dipped in lukewarm water, so as quite to moisten the quills of the sprouting feathers.

Mr. Bailey—about the highest poultry authority in the country—advises that the old hen be confined under a rip, placed on the grass in a warm sheltered situation, and moved about, as often as necessary, to keep the mother and her brood on a clean spot.

At farm-houses, complete success often attends chicken-rearing with much simpler and cheaper apparatus; namely, by a common wicker coop, which may be bought anywhere for fifteen pence, or a bit of wide flannel list, with which to tether the hen.

Some breeders have gone to the expense of making permanent chicken coops, with a comfortable little house, and a run of three feet by six for each brood; but we do not think this so likely to form the best treatment for chickens as any little *movable* contrivance.

As prevention is better than cure, and example better than precept, we may as well say a few words about hatching difficulties, at such times and seasons as they generally occur. One Monday, under a bright sky and a biting wind, a breeder divided twenty eggs (of a choice kind, of course—for who thinks of anything else now?) between two willing recipients—well-tried, broody hens. He set one wide, plump, short-legged old hen in a nest nine inches by ten; and she soon gave signs that her quarters were too straitened by breaking four of the eggs. The remaining sixteen, he found, contained twelve chickens, which went through the process of incubation, without further breakage, to the twentieth, twenty-first, and twenty-second day: still no chickens made their appearance. By this time the chicks were cheeping inside the egg-shells, but none were cracked. A drying and bitter east wind prevailed, finding its way through the few crevices that were in the hen-house. In two of the eggs the chickens had died, which left ten eggs under one hen. The other had had a fresh batch given to her when this was discovered. This was a most unsatisfactory state of things; therefore he had the nest (with the hen in it) taken into his house, and placed over a foot-bath, into which hot water was poured, and an old piece of flannel thrown over all, in a manner to give the hen and eggs a vapour-bath, but not enough of it to set her panting. The nest was left in a room with a fire in it, and very soon the eggs hatched.

He believed the loss of the two chickens, which we have mentioned as having died in the egg-shell at an early stage, to have been his own fault; for, finding one hen had but two good eggs, he made up her nest with others, *which he gave her cold;* and we have no doubt

these cold eggs chilled the two she had. Another hatching, by the same gentleman, was better managed. He gave the hens good roomy nests; almost all the eggs contained chickens, and the egg-shells began to crack on the twenty-first day. Two or three times in the course of the day, he had the hen-house watered with hot water, so as to produce steam in the place, where, as a matter of course, there were no fowls to roost. The next morning, bonny broods were popping in and out round the mothers; but a few of the eggs were still unhatched. One was a good deal broken; but the white skin looked hard and dry, and the chicken was unable to extricate itself. This he opened carefully, dividing the *two* skins sufficiently for the chicken to expand itself. He replaced it under the mother, and the next morning could not tell it from the rest. On the twenty-third day, two eggs only remained uncracked. These he opened, and found dead chickens inside, the lives of which might have been saved if he had opened the eggs the day before. We do not blame him for the delay, although it proved unfortunate in this instance, as the chickens were not crying in the eggs, and as we have known the egg-shell to be, sometimes, opened on the twenty-second day, and found that it should have been left a day later.

Premising that a constant supply of suitable food is the great essential which enters into the rearing of the delicate birds, such as turkeys, pheasants, and guinea-fowl, the following hatching-table shows the periods of incubation of a few tame birds:—

	Number of Eggs.	Days.
Swan	5 to 10	42
Goose	11 to 13	30
Duck	11 to 13	30
Turkey	11 to 13	27 to 31
Pea-fowl	5 to 7	29
Guinea fowl	11 to 15	30
Hen	9 to 13	21

FEEDING.

All who have bestowed attention on the feeding of stock of different descriptions, tell us that *various* kinds of food are necessary for the different functions which it is the object of food to perform. One kind is required to give warmth, and to aid respiration; and another to restore the muscular waste of the matured, or to increase the bulk of the growing animal. If we give only warmth-producing substances, the consumers will fail in the increase of bone, muscle, &c.; and if we give too much flesh-producing nourishment, it goes to waste, or becomes injurious. Experimentalists say that peas, beans, wheat, pollard, oatmeal, and some other vegetables, contain much flesh-forming substance; but it is difficult to say what proportion of them should be used, or what quantity given, without doing mischief. We have known chickens to be fed on two meals a day of these nourishing kinds of food, making up the other meals with barley-meal, potatoes, ground corn, and green food; and they have thriven well.

Fowls, however, are blessed with capital appetites, as every breeder can prove by his bill at the corn-dealer's. The plan of feeding which used to be followed by almost all poultry-keepers (what one may call private poultry-keepers), and which still is followed by some, was to give the fowls plenty of barley, and nothing else. This is neither good for them nor for their owners. Fowls do not thrive on it, and are constantly ravenous. It is proved by the elaborate experiments of M. Reaumer, that each fowl will eat a quarter of a pint of grain *per diem*, when fed on this kind of food only. A great objection which we find to it is, that it is the most expensive kind of feeding we can use. Mr. Bement, the American writer on poultry, found that eight Poland fowls consumed a peck of Indian corn in eleven days; a peck of oats in six days; a peck of barley in seven days; a peck of wheat in ten days; a peck of millet in eight days; and a peck of wheat screenings in seven days. During the experiment, the fowls had a few boiled potatoes only, in addition.

Opposed to this plan of feeding on grain only, is that of some of our most experienced breeders, who feed entirely on meal dough. We do not think, however, that fowls would remain healthy, year after year, fed on meal food only, with no mixture of hard corn to swell in their interior, and to give work to the gizzard.

"The substances that may be used in poultry-feeding," says Mr. Richardson, "are very numerous and various—viz., cabbage, rape,

turnips, carrots, parsnips, mangel-wurzel, oats, wheat, barley, rye, and other grains—substances too well known to require enumerating. It will not answer to feed fowls entirely upon *any one variety* of food; neither will it be found advisable to feed wholly upon any one *class* of food. I must speak of the latter point first. Fowls require a mixture of *green* with *hard* food, fully as much as horses or cattle do. When the birds have the advantage of an extensive walk, they will find this for themselves; when they have no such advantage, you must provide green food for them. Some do so by supplying the birds with cabbages, or other greens, *chopped small*. My plan is to *fasten* heads of cabbages, lettuce, rape, or other green herbs, to some fixture, by means of the roots, and to let the fowls pick for themselves. This practice not merely prevents waste; but is, in consequence of the *amusement* it affords, decidedly conducive to health."

If we make the health and well-being of our poultry the only consideration, everywhere, in the neighbourhood out of doors, is the best run they can have; and if their *habitat* should happen to include rick-yards, with barns and corn-stacks, stock-sheds, with abundance of litter and unavoidable waste food, kitchen-gardens with hotbeds and vegetables of every sort, and flower-gardens, shrubberies, and wildernesses composed of fine loam well stocked with insects, it will be first-rate *for the fowls*. But, as the master is pretty sure to dislike the little unavoidable derangement of the corn-ricks likely to follow this free range; and, as the gardener has a prepossession in favour of doing all the raking himself, it is generally necessary to fence in a piece of ground for the fowls. If they can have a run out into a field or lane, although it may be only for a very few hours each day, we are sure they will pick up many things for themselves, and supply wants which, with all our study of their habits, we may probably overlook, or of which we may be ignorant.

The run, even for a very limited number of fowls, should not be smaller than fifteen feet by thirty. If it is twenty feet by sixty, so much the better, or as much larger as can be conveniently managed. When confined to one spot like this, there are many requisites towards health and well-being, with which the fowls must be supplied, that they would find for themselves, if they enjoyed a free range. Some of these are grass, lime, and small stones.

We consider a mixed dietary the best, both with regard to giving different kinds of food, and a change from time to time. An intelligent and large breeder gives whole corn once a day, and meal-dough twice a day; or corn twice a day, and meal once. The meal-dough is mixed with the hand, with so little water as to leave it dry enough to fall to pieces when thrown on the ground; or it may be mixed with boiling water—not with the hand; that might prove inconvenient—or it may be boiled until quite thick. It can be made of oatmeal, which is very good, but dear; or barley-meal. Either of these, for economy or change, may be mixed with one-third (measure) of middlings or pollard. Potatoes and scraps from the table, bits of stale bread, and pot-liquor to mix with the meal, all make valuable changes in the poultry-yard. These things, and others of a like nature, may form one meal a day, at least, for the fowls.

This gentleman thinks that fowls should have, at least, one meal a day of corn. Different kinds of grain are favoured in different countries. In this country barley is the staple commodity; in America, the fowls are fed almost entirely on Indian corn; in France, a great deal of buck-wheat is used. All these different kinds of grain are good in change, and also oats and wheat. It has been found a good plan to give barley and oats alternately, feeding with each for a fortnight. Wheat, Indian corn, and buck-wheat are used more sparingly, because they are so much dearer; but a little of each is given every day, sometimes for a week at a time, as a change.

In addition to these regular meals of vegetable produce, fowls require a little flesh meat sometimes. When they run out every day into fields and roads, there is no necessity for the owner to attend to this want, except in continued frost, as the fowls find the means of supplying themselves with meat, in the shape of worms, flies, insects of all kinds, slugs, snails, frogs, and such comestibles as suit their palates, and their voracity; nor will a good plump field-mouse escape being turned into hen's meat, if it venture within reach of Dame Partlet's strong beak. But if fowls are

kept to a smaller plot of ground than will give good scratching-room to the number on it, a little meat will do them good, and promote laying.

Various plans have been suggested for producing poultry game. Oliver de Serres' *verminier* has often been mentioned by writers on poultry. It was a hollow place, twelve feet square, and four feet deep, sloped at the bottom for draining. In this were placed straw, horse manure, and earth, each six inches deep; and over all blood was poured, and garbage of any kind, mixed with chaff. In this manner the pit was filled: the rain soon rendered the whole sufficiently moist to produce putrefactive fermentation, and myriads of worms were engendered for feeding poultry. A miniature *verminier* is described by Mr. Nolan, in his work on domestic poultry. "Place bran in a deep crock; lay on it a piece of carrion; cover it with a glass, so as to admit light, but exclude rain; and in a few days, it will be a moving mass of living insects." Worms thus generated by corruption, may be as good as those which come naturally in mother earth; but we cannot help feeling a prejudice against fowls eating such; besides, the hosts of bluebottles, with which such a neighbour would infest the place, might prove a great annoyance. When the fowls want meat, scraps from the family refuse, *fresh* offal from the butcher, or even fresh greaves are better. Care must be taken not to give too much. A quarter of an ounce to each fowl, and that not often, is quite enough.

"I do not think," says Mr. Richardson again, "that one circumstance connected with the feeding of poultry, and that a most important one, is sufficiently well known—I allude to the necessity they are under of obtaining *azotized*, or, in other words, *animal* food. Of course, when the birds possess the advantage of an extensive run, they can themselves pick up insects, worms, snails, or slugs; but, in cases where they do not possess this advantage, it is necessary that you cater for them. I have always experienced the best effects, especially as manifested in greatly increased *laying*, of giving scraps of animal food about twice or thrice a week to the fowls. Bullock's liver answers the purpose well. This I consider to be better in a raw than in a cooked state. In winter, in order to supply the place of the insects and other animal food, which they pick up in summer, I give them, once a week, sheep's entrails, boiled and peppered, together with meat bones to peck at, and also barley made hot in a saucepan, without water, and given warm. Hot potatoes are always good food. Small potatoes may be picked out, and steamed for the purpose. But meat is indispensable, if you wish to have eggs in winter."

Gravel is necessary to birds to aid digestion, and lime for the formation of egg-shell, &c. Stones can be best given by keeping a part of the run gravelled; and lime by throwing down a heap of old mortar, rubbish, oyster-shells either burnt or broken up fine, egg-shells broken up fine, or lime in any other form which will admit of poultry pecking and swallowing small portions.

Of green food, grass is best. Fowls will not do well without green food of some kind; if they cannot run out upon grass, they should have turfs, and a moderate quantity of cabbage, lettuce, or any other green vegetable.

The poultry should be fed with regularity, and have enough to satisfy their hunger. The food should be so scattered abroad that the fowls will have to use some activity to earn the meal; and care should be taken to avoid leaving quantities of food always lying about.

The American principle upon which fowls are fed, is thus shown in the *Miner's Domestic Poultry*:—"The principal food for fowls should be Indian corn, in some shape—sometimes whole, sometimes cracked, sometimes ground to meal, and occasionally ground to the cob. Then you want oats, buck-wheat, and any other grain you please; but the three kinds here named constitute a good supply for the extensive breeder. Besides the above grains, furnish a mess of boiled potatoes or other vegetables several times a week, mixed with meal of some kind; and be careful to change the diet of your fowls often. In the laying season, a solid feed of shelled corn (Indian corn), given profusely, is too heating; and boiled potatoes, if taken to excess, are too laxative. The careful breeder will always guard against these results, by watching the condition of his fowls. If they are relaxed, a change of food

must be given at once, of a more solid nature. A little rye or wheat is an excellent change in such cases. If they are costive, a boiled mash of potatoes will generally be a remedy."

In a work of this kind, it might be expected that calculations would be given as to the most economical mode of rearing poultry; but, as no general rule, alike applicable to Great Britain and Ireland, can be established, we have deemed it better to omit them. Not to speak of the differences of prices which exist between the several products of these countries, there are even differences, in these particulars, to be found in various localities in the same county. This circumstance, alone, presents a difficulty, doubtless, sufficiently great to render all calculations upon this part of our subject nugatory. Respecting the profits of poultry-keeping, the *Agricultural Gazette* has, at various times, given statements. The following are taken from the columns of that paper, and may enable the inquirer upon this portion of our subject, to form a basis for his own calculations, as they have done for those of others.

The actual cost and receipts for the produce of ten hens and a cock in one year, and of twelve hens and a cock in another, are given. The food was all bought at a high market price, and the produce sold in the village where they were fed. The fowls were kept clean, and well housed and attended. They were fed regularly three times a-day when young, and had the run of a large grazing-yard in the day-time.

COST IN ONE YEAR.

	£	s.	d.
40 pints groats	0	8	6
Oats	0	19	4
Barley-meal	0	19	0
Barley	1	0	6
Tail Wheat	1	0	0
Eggs for sitting	0	3	4
Collecting eggs, &c.	0	5	6
Balance, profit	3	18	0
	£8	14	2

RECEIPTS SAME YEAR.

	£	s.	d.
For eggs, at 8*d.*	0	13	8
10 ducks, at 1*s.* 9*d.*	0	17	6
12 do. at 1*s.* 8*d.*	1	0	0
82 chickens, at 1*s.* 6*d.*	6	3	0
	8	14	2
Profit	£3	18	0

COST FOLLOWING YEAR.

	£	s.	d.
For 16 pints of groats	0	3	4
9 bushels barley	2	14	0
Barley-meal	0	7	9
Collecting eggs	0	2	9
Balance, profit	5	5	8
	£8	13	6

RECEIPTS.

	£	s.	d.
For eggs, at 9*d.*	2	11	6
66 chickens, at 1*s.* 8*d.*	5	10	0
8 ditto at 1*s.* 6*d.*	0	12	0
	8	13	6
Profit	£5	5	8

Another authority, in the neighbourhood of Newcastle, gives the following statement of cost and income for sixty hens, principally of the Dorking breed; six ducks, and from seventy to eighty geese:—

COST.

	£	s.	d.
Barley, milk, meal and corn	6	4	1
Woman's wages and market charges	4	12	7
70 geese, at 2*s.* 6*d.*	8	15	0
Balance profit	31	8	10
	£51	0	6

SOLD.

	£	s.	d.
3,400 eggs, at 5*s.* 6*d.* per 100	9	7	0
208 chickens, at 1*s.* 9*d.*	18	4	0
54 chickens consumed at home	4	11	6
60 geese, at 5*s.* 6*d.*	16	10	0
10 ditto consumed	2	15	0
20 ducks, at 2*s.* 6*d.*	2	10	0
	51	0	6
Profit	£31	8	10

To produce anything approaching to these profits, however, it is necessary to have a superior breed, in place of the fowls commonly found in the barn-yard; and also to have suitable houses and yards for their accommodation.

With respect to the poultry of cottagers, which are fed on what would otherwise be wasted, or what is collected by the industry of their children, and warmly housed under the same roof as the owner, they often thrive better, and prove more prolific, than the expensively tended inmates of ornamental poultry-houses. The celebrated Aylesbury ducks are an example of this kind. They are often reared under the beds of the cottagers in Buckinghamshire; and dunghill hens, that roost in the "kitchen and parlour and all" of the peasant, often lay, when the choice, everlasting layers of neighbouring noblemen and gentlemen, seem to have retired on half-pay.

A gentleman breeder found, that from the 24th of March to the 7th of May, he had set 98 eggs under nine hens. From this number 32 chickens were hatched, 20 were dead in the shell, and 46 had no birds in them.

The next year he commenced setting on the 2nd of April, and put, altogether, 72 eggs under eight hens. The produce was 46 chickens; 14 were dead in shell, and crushed by hatching hens, and 12 eggs were addled. Instead, however, of having only 17 chickens from three hens, which were set at the same time, he did not hesitate to say that he ought to have had 21; but, in consequence of two of the hens deserting their nests seven days before the chickens were hatched, he had to get another broody hen, which had only set a few days. The other eggs he had to divide among several hens which were sitting; and, as they chipped, he

had to take them out and place under one hen, and some in flannel on a stove. So that, in fact, it might be said that one hen and the stove hatched these 17 chickens—which were perfectly strong and healthy.

The only sickness he had with chickens was caused by lice, which destroyed great numbers. The bad hatching of eggs was not confined to hens, but extended also to ducks; for out of 24 duck-eggs, he had only five ducklings. He reared 29 chickens over nine months old. For his breeding stock he had two cocks, with five hens each. Only one case of roup occurred; and as the hen was not a valuable one, he destroyed her. One hen died from paralysis, and another from diseased liver. The number of eggs he had was nearly 2,000; and he knew, with the exception of 17, to what purpose every egg was applied. A stock consisting of 17, increased to 60 by chickens in the spring, and purchases, consumed—

Barley	2 loads	19 loads, at a cost of £12 13*s.* 6*d.*
Indian meal	2 „	
Sharps	1 „	
Wheat and rice, mixed	5 „	
Indian corn	2 „	
Oats	1 „	
Potatoes	4 „	
Barley meal	1 „	
Wheat	1 „	

The expense of rearing fowls, as we have said, is subject to great variation; but let us suppose that there were but one kind of cereal on which poultry could be fed, and that it maintained one invariable price throughout the kingdom; "still, the proportional amount of hand-feeding, required by an equal number of fowls, varies greatly, according to the circumstances of their owner. A head of fifty birds, kept at a suburban villa, with high-dressed gardens, and little other elbow-room, will not be able to obtain for themselves the same amount of unpurchased food as the fifty which belong to a small farmer, who has a common in front of his yard, and a young plantation at the back. The fifty that are kept on a dairy-farm will fare differently from another fifty, in whose master's barn the flail is perpetually going. Cochin-China fowls, too, and Malays, will consume a different amount of food from what bantams do; and to strike an average on a miscellaneous collection, gives, in truth, but the phantom of a precise result."

The writer from whom we have just quoted, suggests, as the only way to obtain a safe calculation, to shut up a given number of fowls of the same breed and age, and mark what they consume in a given time. "But the experimenter should be warned, that the birds, when first confined, will probably sulk, and not eat nearly so much as their brethren at large; and so an error will be admitted that would prove of considerable importance, if the calculations founded thereon, were of equal consequence with those on which astronomy, navigation, or even large mercantile enterprises rely for satisfactory results. It is better, therefore, not to attempt giving any account of the quantity of grain each bird may be expected to consume, than to give such an account as must necessarily mislead, if it is made the groundwork of any calculation intended to be generally applicable." Instead, therefore, of aiming at anything like exactness in this matter, we will quote, from the *Agricultural Gazette*, a tolerably full account of the miscellaneous collection of an amateur, and of the way in which they were fed and managed.

"It may be premised," says the writer, "that my object in keeping fowls is not mere money profit. If it were clearly proved to me, that, at the end of the year, I lost a small sum by them, I should still go on keeping them, for convenience and amusement sake; and so would many other country ladies, gentlemen, and clergy. If it could be demonstrated to me that the eggs laid at home cost more, per score, than what eggs can be bought for in Leadenhall market, I would still indulge in the home-produced article, instead of French eggs, twenty-four for the shilling—just as I would prefer a joint of home-fattened pork; although meat, spelt with the same four letters, might, perhaps, be bought in a neighbouring city one-eighth of a farthing cheaper per pound. If men want to enter on the business of fowl-dealing and fatting on a large scale, as a trade to live by, let them serve a short apprenticeship, and they will soon discover the most profitable way of proceeding, according to the produce and the demand of their own special locality. This class of very useful persons are, in general, too acute and too

practically experienced, to need much instruction of the kind from books.

"Another point in view has been, not to attempt the formation of anything like a *complete* collection or menagerie of poultry—though we have always wished to have plenty, both to observe and to eat—but rather to have a succession of breeds and species continually passing in review through our premises; to have their peculiarities noted; a pen-and-ink sketch of their portraits taken; and then, when what we fancy to be the secret of their life has been coaxed out of them, or shrewdly guessed at, to dismiss them as inconvenient supernumeraries, and to replace them with less familiar faces. This mode is better suited to the income, the establishment, and the brains too, of most naturalist poulterers, than to have a vast, overcrowded, unwieldy aviary population, which distracts and perplexes the student as much as it pleases the common starer. There *are* minds capable of threading their way continuously through such a wilderness of interesting objects, and of carrying along with them a collection of clear and conclusive ideas; but such minds are not the majority. It is wiser to attempt the performance of a feat a little below, rather than a little above one's powers.

"Our collection, then, consists of turkeys, geese, ducks, various breeds of fowls, pigeons, with their several young, besides guinea-fowl, guans, a stork, a brood or two of pheasants and partridges, and a few pair of cage birds; altogether about a hundred and fifty head. At seven in the morning, during summer, those birds which had been shut up in their respective houses the night before, are let out for the day. A sprinkling of barley is thrown on the floor of each house the previous evening. The geese (to begin with them) are driven into a large, well-screened orchard (nearly an acre), that slopes slightly to the south, and contains a good-sized pond. There they have thrown down to them a few handfuls of barley, as much as is thought sufficient for their gradually diminishing numbers—*i.e.*, about half of a quarter of a peck for ten or a dozen geese. This, however, is shared with them by such fowls as choose to fly over the fence and join the breakfast party; the ducks, too, will frequently creep through and under the palings; so that, although two or three additional handfuls may be given on such occasions, still, if every handful, or even every grain were counted, no true account could be exactly rendered of the quantity of corn appropriated to the geese. Their principal maintenance is the grass in the orchard; and we find that, during summer, they are thus kept in sufficiently good condition to kill for the house. During autumn and winter they require to be shut up, to fatten in the regular way. About half this quantity of barley is given at noon, and again at sunset, in the court-yard, when they are driven up for the night about eight o'clock.

"Our ducklings are kept pretty nearly in confinement—*i.e.*, in coops with small inclosures in front—from the time they are hatched till they are about a quarter grown. During this infantile state they are entirely dependent on the food brought to them, consisting of bread-crumbs, mixed barley-meal, worms, &c. As soon as they are judged sufficiently robust to take to the water—of about an acre of which they have the range, besides open drains and ditches—they are turned loose with their nurse, but are always got home at night. Previous to this complete enfranchisement, they are, of course, disciplined by a few preliminary swims in a large milk-pan sunk in the ground. If their nurse be a hen, they very soon desert her, and cater for themselves; if a duck, then, under her guidance, they pick up by far the greatest part of their maintenance, costing nothing but the few kernels of barley that are thrown to them three or four times a-day to keep them in the habit of returning home with tolerable frequency. Now it is impossible to make any calculation of what these birds consume or are maintained by, that can afford any real instruction. I cannot properly enter into my balance-sheet, the insects, worms, seeds, and water-weeds on which my ducks grow, get flesh, and even fat, although they are all the produce of my own premises. *De minimis non curat lex.* The law careth not for crumbs and atoms. A farmer who wants to know the exact profit and loss on each duck and hen, would, we take it, be penny, or rather farthing wise and pound foolish; that is, if his time and thoughts are worth money to him. And what most baffles us is, that these

savings, which poultry get from off their walk, to the sparing of the barley-sack, perpetually vary. Thus, from Midsummer to Michaelmas, ducks cost very little to keep, where they have a proper range; and so do other poultry. Nature is then in her most liberal mood. But when the ground is petrified by frost, and covered with snow, it becomes quite a different affair. Fowls are then at their most costly time. A calculation of the expense of keeping them, at either period, cannot but mislead. And as the greater number of ducks do not live six months, their yearly average consumption cannot be taken.

"In the same way, turkey-chicks and common chickens are, with us, assiduously fed on their proper diet, their mothers being cooped, and dependent on the grain given to them. As the younglings gain strength they are gradually released; and, when finally turned adrift, have the range of more than eight acres of lawn and grove, where their mothers and themselves find abundance of nutriment, which, though valuable, cannot be charged in any bill for the maintenance of the growing families. During the time the mothers remain cooped, a person goes round to them as often as is thought needful (that point being much regulated by their respective ages), with a supply of suitable food. It mainly consists of hard-boiled eggs chopped up with lettuce and onions, bread-crumbs, boiled rice (costing 1*s.* 4*d.* the stone of 14 lbs.) as a variety, barley-meal, and fine pollard, either mixed with parboiled rice, or by themselves, with as little water as is sufficient to bring them to a consistence. Little chickens are treated to a few kernels of wheat. The most economical way of distributing grain is to scatter it on the bare ground, and to give no more at a time than the fowls will quite consume; and we find that the only mode of preventing the sparrows from getting much more than their fair share (their really fair share should be none at all), is to remain with the birds and chickens while they are eating, till they are quite satisfied, and to repeat the visit after a short interval. Young chickens never should go more than two hours at most without a supply of food; for adult birds, three times a-day is plenty. It does not appear to me that extreme precision in stating the weights and measures of the articles used as food for live stock, is so very necessary or expedient. For creatures that have either to work hard, or to grow, or to get fat, a little too much food is better than a *little* too little. We should prefer even some waste by sparrows, to seeing our poultry stunted in their growth, or checked in their moulting, or moping about in ill-conditioned plumage. Full-grown guinea-fowl, that have a range (and they should not be kept otherwise), require no more corn for their maintenance in health and in full laying powers, than what they *will* have when the poultry is assembled by the rattling of the corn-measure at morning, noon, and night. With us, the least profitable birds are, we believe, the pigeons, of which there are about forty. Besides the corn which these get at the general mess, they are entertained with peas, at the rate of about a peck a-week, in their private apartment, the pigeon-loft, to which, however, they are not at all confined. They are fed at an extra rate to prevent them trespassing on our neighbours' fields. Pigeon-pies, in sufficiency, could be had at a less cost; and the sale of choice pairs is not resorted to as a means of lessening the expense of keeping the flock.

"The commissariat department of every rearer of a general stock of poultry, must be arranged, not as for a regular army, where the men are all of a certain equal height, and are supposed to be of a certain equal capacity of stomach; but as for a mixed multitude or rabble, such as the followers of Peter the Hermit; or a disorganised riotous populace, consisting of old and young, male and female, healthy, sick, and lame. To the entire mass of this feathered band of insurrectionists (and very riotous they do become as the pangs of hunger continue to pinch them), it may be advised that three feeds of corn a-day be administered till they are tolerably satisfied. It is an error to believe that poultry will eat corn to repletion; they will turn from that, when they feel they have had a sufficiency, to pounce upon the fly, drag out the half-hidden worm, or crop the sprouting grass. Wastefulness in giving corn to fowls, consists in throwing them down a large quantity at once—more than they care to have—and then leaving them to themselves, instead of doling it out, handful by handful, and stopping the distribution as

soon as appetite begins to flag. They should not be allowed to leave a grain. The juniors, the prisoners, and the invalids must have separate attention, which we shall not be expected to particularise here. For poultry that is put up to fatten loose in a small shed—really a good and more healthy way than fattening-coops with separate compartments (for we never see a return of the number of birds which die, instead of fattening, from this incarceration)—for poultry so confined, no feeding-trough is better than that figured as for turkeys in Dixon's *Ornamental Poultry*; but even the degree and kind of fatness expected in poultry, is a matter of local taste and fashion. Most country-people like a fowl, or a duck, that has been kept at large in high condition, either at the barn-door or in the pond, without any confinement at all—thus making an approach to the edible qualities of game. Londoners prefer birds that have never stirred, except in a dark cellar, nor used their wings, unless to help them to a perch three feet from the ground at most. This inaction of the muscles gives a peculiar tenderness to the flesh, and unctuousness to the fat, which is much valued by metropolitan purveyors. As far as the digestion of the eaters is concerned, it would be well if the parties could change their taste. The capon-like and luscious peculiarity of the fowls supplied by the best London poulterers, requires a little fresh air and exercise to settle comfortably; while the lightness of the barn-door flesh, if not eaten too soon after slaughter, is more suitable to a sedentary stomach. How hard, then, is it to dictate which is 'the best mode of feeding and fattening,' when connoisseurs differ so widely as to the result most worthy to be aimed at!"

FATTENING.

Poultry intended for the table, like every other living thing raised to be eaten in an artificial state of society, must pass through a certain change previous to its being subjected to the masticating process of the mouth of man. In order to have a chicken fat, the best thing to do is never to allow it to get thin. To "fetch them up," however, for the table, they should either be absolutely cooped up, or, at all events, inclosed in a very small space. If they are put into coops, these should be warm, rather dark, and placed under cover. They should also have sufficient height, and be large enough for each fowl to be comfortable, without being forced to move about; and each should have a portion of the coop partitioned off to itself, so that it may see its neighbour, without touching it. At the front of the coop, there should be a large trough to hold the food, with a compartment for water, raised fully an inch from the ground. What this convenience is to be made of is a matter of taste; but, instead of wood, either pottery or glass is recommended as even more suitable, on account of their being more easily kept clean; whilst they look equally well, and are by no means expensive. The back part of the floor ought to be grated, so that the droppings of the fowls may readily pass through. The birds should be starved for a few hours after cooping, and then supplied regularly, three times a-day, with as much food as they will eat, and no more. The trough should be cleaned out each time after they have been fed. Very little water should be given them. In this manner, steamed potatoes alone have fattened chickens in eight or ten days. Boiled dry rice, moistened with milk or water, is also a very fattening diet; and if accompanied with a portion of treacle, the process is greatly quickened. By great attention, and giving a constant variety of food, in order to excite the appetite of the fowls, they ought to be ready for the table in a fortnight. Vegetables of every description, and grease of every kind, they will eagerly devour and fatten on; and the most economical plan is to boil everything given to them. Upon this subject Mr. Bailey has written a practical little pamphlet, called *The Dorking Fowl: Hints for its Management and Feeding for the Table;* from which we extract the following passage:—

"I advise, from the first, to feed the hen and her chickens well, in the following manner. Instead of throwing down handfuls of whole corn, let it be ground, and slaked with lukewarm milk, to such consistence, that when a ball of it is thrown on the ground it will break, and scatter about in particles. If there be green-meat, such as onion-tops, chopped fine, and mixed with it, so much the better. The chickens should be fed in this manner three or four times per day, and the little extra

trouble will be amply repaid by their growth and health. As they get older this may be gradually discontinued, and they may feed with the old fowls on whole corn. But even with old birds a change of food is not only advantageous, but necessary; and I would therefore advise that, once a fortnight, the food be changed for a day or two, and boiled or crushed corn substituted for whole. They must also have constant opportunities of picking among grass and other herbs. Fowls in confinement will starve and pine to death with heaps of barley around them, unless they have such opportunities." An observance of these rules would save the editors of agricultural journals the task of answering many a poultry inquiry, in their "Notices to Correspondents."

For the banquets of the ancient Romans, poultry was carefully reared and fattened, as well as *crammed;* the operation of which, according to authority, does not seem to have greatly differed from that practised in our own day. The tastes of the birds, and the advantages to be derived from feeding them in a dark place, were well understood.

In France, the practice of cramming is, at present, quite common. For this purpose a machine is used, constructed on the principle of the forcing-pump. With the aid of this instrument, one man can cram fifty birds in half-an-hour. In operating, the throat of the bird is held until the stomach is gorged through a pipe, which forces the food from a reservoir. This process causes the fowls to attain the highest state of fatness and flavour in fifteen days.

HOUSING.

In choosing a hen-house, as in many great events of life, most persons have to consider what they *can* have, rather than what they would prefer. The house *must* be weather-tight and well ventilated; it *should* occupy a sheltered spot, and enjoy a warm, sunny aspect. Crowding should be carefully avoided: a dozen fowls is enough for a house ten feet square, and so in proportion. The talented author of the *Poultry Pentalogue,* says the house "should be composed of non-conducting materials, that it may be comparatively warm in winter, and cool in summer." This would promote laying in cold weather, and mitigate distress from heat. "My own fowls, however," he continues, "never did better than when kept in a rough weather-boarded place; but then it was but loosely parted off from the end of a large cow-house, which was always filled with cattle in the winter, and empty in the summer."

It sometimes happens that mortality, for which we can assign no reason, makes most unwelcome inroads on our poultry; and when we reflect upon the manner of life of our favourites, it is difficult to find a solution of the discouraging enigma. The fowls had access to gravel, lime, grass, and also had a liberal supply of food properly varied; yet sickness and death were of frequent occurrence. As wholesome air is as necessary to the well-being of every living animal as wholesome food, the breeder of stock, of every description, will find it advantageous, occasionally, to visit the sleeping-places at night. When fowls follow their own instinct, they seek a lofty place to roost upon. Now that we bring them to a weight and bulk which they would never attain in a state of nature, we counteract this instinct; and, as the wings of such heavy birds are incapable of saving them from injury in a great descent, we oblige them to roost near the ground. By this means we bring them nearer to the carbonic acid gas, which, from its specific gravity, falls to the ground. Many useful hints, on different subjects connected with the rearing of stock, may be found in a work entitled *Agricultural Chemistry,* by J. C. Nesbit, F.G.S., F.C.S., &c.; to which we refer the reader.

A piece of any convenient part of the hen-house may as well be left unfloored, to be divided off into nests, leaving the bare earth for the bottoms of them. They will do either with or without straw. If baskets or boxes are used for nests, for the safety of the eggs, they had better have an abundant supply of straw.

We have just observed that large fowls should never roost high; for if *half-a-dozen* hen-ladders are placed for their convenience, they prefer to use their wings, which were never made to poise, in mid-air, from seven to eleven pounds of fatted, feathered flesh and bone. The best practical judges reckon that the perches should be *within* two feet of the ground, and made of poles from four to six inches in diameter

We would never leave fowls dependent on the hen-house alone for shelter. In addition to that, they should have a shed, under which they may find protection from rain and hot sun, and a dry spot for a dust-bath, which must be always supplied with plenty of dry dust, in the use of which the fowls will require no teaching. If a good potting-shed, or any shed of the kind, be included within the precincts of the hen-run, nothing can be better for the fowls; and they can do no harm by having a corner for a scratching-bit. If there be no such shed ready to hand, a slight one can be constructed at small expense. A few lengths of carpenter's quartering, made into an oblong frame, fixed upon a sufficient number of legs (according to its length), and covered with rough board or patent felt, will answer the purpose very well.

There are numerous kinds of fencing for forming the boundary-line to the run. Galvanised iron wire, stretched on a framework, is neat and durable. Galvanised iron netting may be set up, with the support of upright iron rods only. A firm rod along the top of a low fence had better be avoided, for it will be used by the fowls to lodge on in getting over. As they are less likely to rest on an edge which is shaky or uneven with spikes, some manufacturers make their wire-work for poultry without the finish of a wire at the edge which is intended for the top of the fence. The cost of a wire fencing is from one penny to threepence per square foot.

In Suffolk, an excellent warm fence is made by bracing fagots of fern, gorse, &c., close together upon iron hurdles.

Common sheep hurdles, in the usual position, will make a good fence for poultry; but placed on end, fixed together, and made firm with stakes, they afford a fair high fence, where appearance is not an object of consideration. If thatched, they will make a very tolerable hen-house. Simply fixed with the spikes in the ground, they are not high enough to keep in any poultry, nor firm enough after two years' wear and tear; but these defects may be remedied, and a good lasting fence made of them, at the expense of a little labour. If the poplar or the willow grows in the neighbourhood, it is not a bad plan to cut large sprays of either, about six feet high, and stick them into the ground so close together, along one side of the hurdles, that the twigs meet and cross above them, so as to form a tolerably close screen. They will take root, become firm supporters to the hurdles, and form a lasting, and not an unsightly fence.

A lattice of laths is quite as dear as wire netting, and not so pretty; neither, we think, will it be found so durable.

With the addition of drinking-pans—of which the best are those which can be kept clean most easily—the home of the fowls may now be reckoned ready for their reception.

All pans for food, and divers contrivances for inducing the fowls to stuff themselves immoderately, we repudiate.

As a suitable conclusion to this part of our subject, we subjoin a description of the cottier's poultry-house, as given by Mr. Richardson.

"One of the best modes of rearing fowls, is the old custom of suffering them to roost on the rafters of the room in which the cottier keeps his fire. It is, perhaps, owing to the warmth thus afforded to the birds, that during winter, when eggs are scarce, and consequently at a high price, they will be procurable from the humble cabin, when they have long vanished from the elaborately constructed, but less *warm* poultry-house of the more affluent breeder.

"Should circumstances, however, render the keeping of poultry in the cabin objectionable or unadvisable, a very suitable place may be erected for them against the outside of the cabin wall. If possible, the part of the wall against which the little hut is erected, should be that opposite to the fire-place within; thus securing the necessary warmth. If shelter be required, it can be obtained by means of a few bushes, or a wall of sods. The neighbouring roads will serve as an ample walk; and the nearest stream will slake their thirst. A few laying-nests may be placed in a warm corner of the cabin. By these means, the poultry of the poor cottier will thrive as well, and yield as great a profit, as those kept in the best-appointed establishments in the kingdom."

CHAPTER V.

THE TURKEY; GUINEA HEN; PEA-FOWL; PHEASANT, ETC.

THE TURKEY

Under the singular impression that this bird and the *Meleagris* of the ancients are identical, Linnæus, and some other naturalists, have designated the Turkey as the *Meleagris Gallipavo*. This error was first observed by the French academicians, who pointed it out; and it is now generally accepted as correct.

The common turkey is a native of North America, and was introduced into England in the reign of Henry VIII. According to Tusser's *Five Hundred Pointes of Good Husbandrie*, it began, about the year 1585, to form an article in our rural Christmas feasts:—

"Beefe, mutton, and porke, shred pies of the best,
Pig, veale, goose, and capon, and *turkie* well drest;
Cheese, apples, and nuts, jolly carols to heare,
As then in the countrie is counted good cheere."

The turkey is one of the most difficult birds to rear of any that we have; yet, in its wild state, it abounds in the forests of Canada.

The origin of the name appears to have arisen from the confusion that, at first, subsisted relative to the identity of the bird with the Guinea fowl, which is really a native of Turkey, and was introduced into England from the Levant. Athenians, and other classical writers, with the most minute accuracy, refer to this fowl; and in scarcely one particular, can any resemblance be traced between it and the turkey.

The disposition of the female turkey bird is, in general, much more mild and gentle than that of the male. When leading out her young family to collect their food, though so large, and apparently so powerful, she gives them very little protection against the attacks of any rapacious animal that may approach them. She rather warns them to shift for themselves than prepares to defend them.

The best mode of keeping turkeys, is to allow them a large open shed, sufficiently protected from the weather, and, above all, from *moisture*, to the destructive effects of which the turkey is singularly liable. The perches should be high, and a *hen-ladder* is very necessary to be placed in their habitation. The reason for suggesting this is, that although turkeys may fly very well in their natural state, yet when fattened by the arts of domestication, they become by far too weighty for the strength of their wings. The consequence of this is, that they often injure themselves in their descent from a lofty perch, more particularly if kept in a state of confinement. When enjoying the fulness of their liberty, they are enabled to take better care of themselves, and also to take such an amount of *exercise* as will preserve them from assuming aldermanic proportions. In warm weather they should be allowed to choose their own roosting-places, whether on the trees or about the farm; but if frost be expected, this liberty must not be granted them, on account of the tenderness of their toes, and their susceptibility to be frost-bitten. To these birds, although originally the inhabitants of an extremely cold climate, it is now found that summer is the only season of the year when they may, with safety, be permitted to roost out of doors.

In a wild state turkeys are gregarious; and associate in flocks, sometimes to the number of five hundred. They frequent the great swamps of America to roost; but leave these situations at sunrise, to repair to the dry woods in search of acorns and berries. They perch on trees, and gain the height they wish, by rising from bough to bough, and generally mount to the summits of even the loftiest. They are very swift runners, but fly awkwardly; and, about the month of March, become so fat that they cannot carry themselves beyond three or four hundred yards, and are then easily run down by a horseman.

The females lay their eggs in spring, generally in some retired and obscure place; for the cock, enraged at the loss of his mate while she is employed in hatching, is apt to break them. They sit on their eggs with so much perseverance, that, if not taken away, they

will almost perish with hunger before entirely leaving the nest.

The morning is the time when the hen turkey usually lays; some performing this operation daily, and others only every second day. From fifteen to twenty eggs is the number generally laid; but this varies according to the age of the bird—a hen of a year old laying fewer eggs than one of greater maturity. When the turkeys are about to be let out in the morning, the hens should be examined, and those which are about to lay should be kept in until that process has taken place.

The eggs, as we have said, are to be taken away as soon as laid, lest they be broken, through the awkwardness of the hen, or sucked by vermin; and if put into a basket, and suspended in a dry place, they will keep till the hens have done laying. As the hen turkey has no very refined feelings of exclusiveness, there is no necessity for keeping the eggs, belonging to each, in a separate place. Her disposition manifests no wonderful excess of maternal love towards her eggs; neither are her discriminative qualities very great; for she will, with equal kindness, care, and attention, rear a batch belonging to another, as if they were her own. Even in the nest, such eggs as those of geese, ducks, and common fowl, do not come amiss to her. In the second laying, the eggs are fewer in number, and rarely exceed from ten to thirteen; but, on this occasion, more than ordinary care is requisite.

We have observed that the hen turkey is a most persevering incubator; and Mr. Richardson says, that "if her eggs were not taken away, she would sit upon stones, if she could not procure the eggs of another bird, and would perish before quitting the nest. Eggs should, therefore, be left with her, not only to tranquillise her, but because sitting upon eggs fatigues her less than sitting upon an empty nest. These eggs, however, should be marked, in order to distinguish them from those the poor bird continues to lay. Any eggs that seem to her to be slow of hatching will be abandoned, as she will quit the nest as soon as she perceives the chick. Consequently, as soon as the eggs you have placed under her are hatched, she will leave the nest, and the eggs of her own laying will be sacrificed. Remove, therefore, the former. It is for this reason that I recommend them to be marked. Keep the nest clean while the turkey hen is sitting, as dirt will injure the eggs. No person should go near a hen when sitting, except her keeper; and none should turn the eggs, or meddle with them further than I have already indicated. The bird will turn her eggs with more judgment than you can."

The time of sitting varies. Sometimes it is twenty-seven, and at other times thirty-one days. When the latter takes place it is at Midsummer. As some of the chicks come forth more slowly than others, these should be removed to a place where they may get greater warmth; but, generally speaking, all interference should be avoided: where, however, they have been removed, they may be returned to the hen for six or eight hours before feeding them. As in cases with more common fowls, assistance is sometimes necessary to enable the chick to leave the egg; and if so, the utmost caution should be observed, lest any injury be the result. A too great eagerness to render aid, on these occasions, often does far more harm than good.

Many writers recommend a vast deal of what may well be denominated quackery in the treatment of the young chicks; but they generally thrive much better when left to themselves.

In feeding poults, after the second month, it will be sufficient to supply them with such boiled herbs and plants as are esteemed nourishing. Those which in their natural state they would feed upon, are, as a matter of course, the best. Among these may be enumerated wild succory, nettles, milfoil, turnip-tops, cabbage-sprouts, or the outside leaves of greens, well macerated by boiling. Potato skins, or a few potatoes themselves, may be given; and, if beans, oats, barley, or buck-wheat be amalgamated with them, the poults will rapidly fatten. Besides these, the meal of Indian corn is advantageous; but, as this requires to be boiled three times more than that of oats, it is proportionally more troublesome to be used as a food. If, however, the market has to be met, the sooner the poults can be "got up" the better; and, although the feeding required for this may be a little more expensive than usual, the results will, nevertheless, prove satisfactory. When approaching their sixth month, especially if there be an appearance of cold

weather setting in, give them boiled potatoes, mashed and mixed with meal, and then chopped small. This should be given them *fresh* and *fresh*, in a vessel perfectly clean, and always to be kept so, lest it contract a disagreeable smell. It must be remembered that turkeys are particularly nice in their appetite, and are also very cleanly in their habits. After a month of this kind of feeding, morning and evening, the poults will be in a condition to be made use of; and, if of a good sort, they ought, at least, to weigh eighteen pounds. During this process of fattening, they should, after their meals, be kept pretty much in the dark; indeed, a great portion of their time should be spent in darkness, and their exercise much curtailed.

In considering the advantages in connection with the expense which attaches to the raising of turkeys, it must be borne in mind, that until they are wanted to be fattened for sale, there is no necessity for nourishing them to the extent we have just indicated, as, of all our domestic fowls, they are the best providers for themselves. They are also blessed with a good digestion; therefore, nothing comes amiss to them in the way of herbs, grass, berries, fruit, corn, insects, and even reptiles. This universality of appetite, so to speak, generally enables them, in their wanderings, to find plenty to satisfy themselves, almost without the artificial assistance of man. In its native forests, a favourite food of the turkey is the seed of a kind of nettle, and a small red acorn, on which latter food they soon become so fat as not to be capable of flying, when they are easily run down by a dog. The weight to which the bird attains, in this country, has been much exaggerated; but twenty pounds is a fair weight for a fat yearling bird. For one only six months old, this is a very great weight. A turkey weighing thirty pounds, of any age, is a fine bird; and few, save the Norfolk, ever exceed forty.

Cold, or damp, being fatal to turkey poults, it is necessary that the weather should be watched before allowing them to stray far from their habitation. Intense sunshine is also fatal to them. In such weather, therefore, they must not be led to pasture, unless this can be done under shade. Should rain fall, they must be at once housed.

To the peasant the turkey is a bird of considerable profit; as, among the hedgerows, and upon the roads, it can find almost as much food as suffices for its maintenance. Worms, snails, and slugs are amongst its most favoured repasts; and any stream suffices to quench its thirst. From its great partiality to grain, however, it is a pest to the farmer, who should circumscribe its roaming propensities to the boundaries of his yard, until his crops are so strong in their roots as to offer no temptation to its depredations.

THE GUINEA HEN.

It is difficult to ascertain the precise time when the Guinea fowl was first brought into Great Britain; but its introduction must, at all events, have taken place at a remote period; for, in Kennet's *Parochial Antiquities*, it is stated that it was well known in England as early as the year 1277. Its original country is Africa. The Guinea fowl is a little larger than our ordinary barn-door fowl; but it is inferior in size to the larger foreign breeds, as the Malay and Spanish. In both aspect and character, it appears to occupy a position between the pheasant and the turkey. Although long familiarised, the Guinea fowl has never been fully domesticated. It still retains much of the restlessness and shyness of its primitive feral habits. Its courage is very great, as it will not only attack the turkey, but frequently conquer him.

The cock and hen are so nearly alike, that it is not easy to discover which is which. Sometimes there is a difference of hue in certain parts; but this difference only occurs occasionally; and it is rather on the distinction of voice and demeanour that we must chiefly depend, in order to distinguish the one from the other. It must be remarked that they pair; therefore, a second hen will be neglected and useless, except for eggs.

As a source of profit these fowls are not much to be recommended. The eggs are very small, three of them being scarcely equal to an ordinary hen's egg; and the flesh of the bird is not relished by every palate, though it is in tolerable request in the London markets, when the game season closes. Its flavour resembles that of the pheasant.

This bird dislikes confinement, and will not thrive unless it has perfect liberty: where such,

therefore, cannot be afforded, it is useless to attempt to keep it.

The hen commences to lay in May, and continues throughout the entire summer. For the table, the birds are in season from February to June. The period of incubation is twenty-eight days. The chicks, while young, require careful management, and must be constantly fed. In a short time they become perfectly hardy. At nine months they are fit for the table. The hen is prolific.

THE PEA-FOWL.

A peacock, in all the pride of his "Argus-eyed tail" spread before the rays of the sun, parading on a green lawn, or from the extremity of a terrace wall, is one of the most beautiful of living objects which can adorn the garden landscape. Of fruit, however, he will be found a devourer, not to be guarded against; and both him and his mate are not unfrequently the veritable assassins of the young of other fowl. The cock does not attain the full splendour of his plumage until he is three years old: and the hen does not lay until she is of the same age. She lays from five to seven eggs, and sits twenty-nine days. If the first batch of eggs is taken away, she will lay a second; so that, by having a hen turkey as foster-nurse, two broods in one summer may be obtained. The pea-hen generally chooses a very retired spot, quite out of the way of the peacock, which is often a cruel, unnatural father.

The young of this breed must be tended like Guinea fowl and young turkeys; and without they are abundantly and regularly fed, they are apt to wander. When fat, and hung long enough, they make a delicious and enviable roast. They should be larded over with slices of fat bacon; the head and neck, with the feathers on, carefully wrapped in paper, and tucked under the wing, away from the fire; and, when ready, set up in purple glory, to match the tail adorned with feathers, neatly stuck in at the last moment.

THE PHEASANT.

We have already treated of the Pheasant in the division on "The Gun;" but here it is necessary to say a few words upon it, in what may be called its domesticated state.

To hatch the eggs of this beautiful bird, a Bantam hen is the best. The young ones should be left with her for twenty-four hours after being hatched, without being disturbed; and then they should be fed every hour with hard-boiled eggs, bread and milk, bread crumbs, young nettles, or lettuces, chopped fine, and eggs from ants' nests. They should be kept in a dry, warm place, and be allowed plenty of fine soft sand. A piece of meat may be put in a convenient spot, and kept there till it becomes fly-blown, when the maggots, thereby generated, should be given them every day. When moulting, supply them with a little boiled rice. The vessels in which they are fed must be kept quite clean; and as they are subject to various diseases, alum-curd, made by boiling new milk with a lump of alum, until it is of the consistence of custard, may be given them. If vent-bound, clip off the vent feathers carefully, and apply some sweet oil to the part.

Although we have recommended a Bantam hen for a sitter, there are many circumstances under which it may be found necessary to hatch and rear young pheasants by means of common hens. In Stonehenge's *Manual of British Rural Sports*, the author says—"The old hen of each hive or nide is always anxious, if alive, to retain her old nest, and to drive the young hens away from her neighbourhood. If the keeper is not on his guard, the hens stray far off his beat; but if watchful, he can easily detect the nest of almost every pheasant. If the eggs are likely to be taken, he may then, and then only, as soon as the hen has laid her full number, remove them. Hen pheasants will spread themselves abroad, and no art will keep them closer together than they like; but the above plan may save a great many eggs. There are many situations in which nests *should* be disturbed, if found early enough, or the eggs taken if found late: for instance, in situations likely to be flooded; in ditches or hollow water-ways, or in clover-fields or vetches which will be mowed over before the time of hatching."

As the hen pheasant never rears her full number of chicks, five or six eggs should be removed from every nest which is found. A moderate-sized hen will cover thirteen eggs. She should be set in a box without a bottom,

so that the nest shall be on the ground; and the box should have a lid, that the hen may be shut in. The boxes should be eighteen inches high, and perforated, to admit of ventilation. The hens must be let off to feed, and shut up again. Boxes are only necessary where a number of hens are set together. When the hens have sat for five or six days, the eggs may be tried, and all which are not good, removed, making up each hen's nest, and giving fresh eggs to those that may be left without any.

After the pheasants have been hatched about ten hours, the hen should be put under a coop, solid all round, except two bars in front, just wide enough to allow the poults to run in and out. In other respects it is the same as a common rip for hen and chickens. This should be placed on the grass, on a sunny spot, with a west or south-west aspect.

While the chicks are quite young, a run should be made for them, by three boards a foot and a-half wide, to be supported by pegs driven in the ground, to fence in a square piece before the coop. This piece to be made safe by a network covering.

If the chicks are strong at the end of a week, the little inclosure may be removed, and they may run at large. When the chicks are a month old, some breeders recommend that the hen should be tethered by day, and placed in the coop again at night. A constant supply of clean water is very important.

The greatest difficulty is to *hatch* the eggs, for they are very easily spoiled by being shaken. In the early days of sitting, the embryo chick is so delicate, that a very slight blow or shock destroys life, and the egg becomes addled. If a hen can be reckoned on, it is far better to wait till within a week of the time of hatching, as the eggs will bear removal very well at that time, if placed in a basket full of warm, dry wool. In this way we have known eggs removed more than twenty miles, and afterwards nearly all hatched.

For a coop, some make a box, nearly three feet long, two feet wide, and two feet high in front, sloping off to one foot high at the back, and give it a boarded floor. This box has a lath front, with intervals to allow the young birds to pass out. This is the coop for the hen; but the young birds ought to have a further space of about two yards square to run in, fenced off by some means. In rearing young pheasants and partridges, success is more likely to crown our care in a walled garden, as they are then almost safe from the attacks of the weasel, stoat, or rat. If this cannot be procured, we should be careful to select a good aspect, sheltered from the east and north, and open to the morning sun. It should not be exposed to the incursions of poultry. For food, ants' eggs are the best, if they can be got in sufficient quantities; or maggots, scoured by keeping them twenty-four hours in bran. Mix oatmeal and eggs together carefully; tie them up in a cloth; boil them until hard; and this, broken up, makes excellent food. When the young ones are a fortnight or three weeks old, soaked bread, or bruised barley soaked, may be given, and, soon afterwards, whole barley; but ants' eggs and maggots should be continued even until the birds are turned into the woods. The feeding recommended by some is—first, hard-boiled eggs chopped fine, crumbs of bread soaked in milk, curd pressed in a cloth until dry, and ants' eggs; afterwards, dough, of oatmeal and water. This must not be thrown down to them, but they must be fed with little balls of it as long as they will eat. For change, give barley and wheat.

THE DOMESTIC DUCK.

In keeping ducks, one of the first considerations to be attended to is, to see that they have plenty of water; for, although a small quantity of this will suffice for them, still, to have it always in such a situation as will admit of easy access to it, is one of the most essential points of duck-keeping. As the flesh of this kind of fowl always, more or less, partakes of the flavour of the food upon which the bird has been fed and fattened, it should be confined, at least, for not less than a week before it is killed, and put upon a more choice kind of food than the duck will feed upon when left entirely to provide for itself. This bird is by no means very particular as to what it eats; whilst its capacity of gormandising is, where opportunities offer, carried to an enormous extent. We have seen some of them admitted into a field to follow the plough

while at work, when they have so stuffed themselves with the exhumed worms, that they have actually been unable to rise after lying down. For the purpose of fattening, and bringing their flesh to a good flavour just before killing, boiled potatoes are excellent, and, if mixed with a little grain, the feeding is greatly improved. Indian meal is also good, although, at first, it should be given sparingly. If ducks are allowed to enter a garden, they will not do much harm, while they will help greatly to free it from slugs and insects; but, as they are rather ungainly walkers, and by no means remarkable for any extraordinary beauty of plumage, we, ourselves, would rather put up with a few extra slugs in our flower-beds, than permit a few of these unhandsome creatures to walk over them at their pleasure. Ducks lay a large number of eggs; and we have heard of the case of one laying upwards of eighty in succession. This is prodigious; and when we consider that three duck-eggs are, in culinary estimation, of the value of six hen-eggs, a bird possessed of such prolific powers is not, even in a commercial point of view, to be lightly estimated. It is mostly by night, and not by day, that the duck lays; and while producing, she requires a greater degree of attention than the hen, until she has acquired the habit of resorting to a regular nest. When she has done this, attention is no longer necessary. In hatching, the eggs require thirty-one days; and after the ducklings have come forth, they should have, for their first food, boiled eggs, nettles, and a little barley. For the first day or two they should be kept from water; but after they have seen the light for a few days, they may, with the greatest safety, be left to shift for themselves. The drake should have from four to six females, as he does not pair like the wild duck. Of the domestic duck there are many varieties; the white having a preference by some over all the rest. Of this variety, the Aylesbury is the favourite. It is very easily tamed; and, in Buckinghamshire, it lives with the cottager in a state of domestic familiarity, similar to that which characterises the sociable qualities of the pig in the cabin of the sister isle. In this county, many of the cottagers add to their little incomes by rearing the Aylesbury duck for the market; and the interior of the cottagers' dwellings sometimes presents a singular appearance to the eye of the stranger. They are supplied with boxes and pens, ranged round the walls, for the purpose of protecting the early broods, which may be said to be brought up by hand. This duck is a large, handsome bird, with unspotted plumage, yellow legs and feet, and flesh-coloured bill. It is a most assidnous mother, and very productive.

Until the introduction of the Rhone, or Rohan duck, which is very prolific, and lays large eggs, the Aylesbury variety was held to be the most valuable of all the species. The latter, however, still fairly divides the honour with the former, and is by some regarded as superior. Its flesh is of a most delicate flavour, being by many compared to that of the chicken; but it is said, that a cross between it and the Rhone is superior in flavour to all others.

In France, ducks are both excellent and abundant, especially in Languedoc and Normandy, where duck-liver pies are considered a great delicacy.

THE MUSCOVY, OR MUSK DUCK.

This bird does not, as some suppose, take its name from having been imported from that country, but from the *flavour of its flesh*. It is easily distinguished by a red membrane surrounding the eyes, and covering the cheeks; and the *Musk* name, by which it is distinguished, is both a contraction and a corruption of the term Muscovy. It is a distinct species from the common duck; and the hybrid race will, therefore, not breed again between themselves. They are, however, capable of doing so with either of the species, from the commixture of which they sprung.

THE BLACK EAST INDIA DUCK.

This species of duck is all black, except the bill, which is deeply tinged with a rich green. When floating on the bosom of a pond, mingled with the pure white Aylesburys, they present a beautiful contrast. The varieties of waterfowl may, perhaps, be as well studied in the inclosure of St. James's Park, London, as anywhere else.

THE CALL DUCK.

This is the *Bantam* of its race, usually coloured like the wild mallard, but often *white*—a colour

preferred by fowlers, who use it in the decoys, on account of its being so easily distinguished from the others. These birds are a Wiltshire breed, with compact and elegantly rounded crests, and are very handsome.

CAPONISING.

The practice of converting fowls into capons has been long followed by the Chinese; but it does not appear to have been early practised in Europe. Some years ago the French began to use it extensively; and now, both on the male and female fowl, the practice is quite common. The object proposed in making a cock a capon is the taming of his natural fierceness, so as to render him of a more placable disposition; and assuredly it has this effect. His pugnacity entirely deserts him. He no longer seeks the company of the hens; he grows to a far larger size than he otherwise would have done; acquires flesh with far greater rapidity; and that flesh is peculiarly white, firm, and succulent. Even the fat is perfectly destitute of rankness. The process which effects this singular metamorphosis in the disposition of the bird is extremely simple, and one which the rural hen-wives of France perform with facility and certainty. The practice of these is to select the close of the spring, or the beginning of autumn, as well as fine weather, for operating upon their fowls. The parts necessary to be removed being fixed in the abdomen, and attached to the spine at the region of the loins, it is necessary that the abdominal cavity should be opened for the purpose of their extraction. The bird should be healthy, fasting, and about three months old. He must then be secured by an assistant, laid upon his back, with his belly upwards, and his head down, that the intestines, &c., may fall up towards the breast; the tail is turned towards the operator. The right leg is then carried along the body, and the left brought backwards, and held in this position, so as to leave the left flank perfectly bare. Here the incision is to be made; and this is to be directed, from before, backwards, transversely to the length of the body, at the middle of the flank, and slightly to the side, between the ends of the breast-bone and the vent. Having plucked away the feathers from the space where the cut is to be made, a fine-tempered pen-knife is taken, and the skin, abdominal muscles, and peritoneum incised. This is best done by two or more cuts, in order to avoid the possibility of wounding the intestines—a casualty which would, in most cases, be attended with fatal results. The intestines will then present themselves at the orifice; but they must not be allowed to protrude. On the contrary, they must be pressed gently aside, so as to leave room for action. The incision should be sufficiently large to admit the fore-finger, previously well-oiled, to pass into the abdomen, and to be carried carefully towards the lumbar region of the spine. There will be found what is wanted. You first reach the *left* substance, which is to be detached with the nail, or with the finger bent hook-fashion. The right is treated similarly. Bring both substances forth, and return the intestines; sew up the wound with a silk thread—a very few stitches will suffice—and smear the place with a little fresh butter. Some persons recommend the amputation of the comb, close to the skull of the newly-made capon; but this is an unnecessary piece of torture; though, of late years, it has been exclusively adopted on the continent: the proposed object of this amputation being to insure the recognition of the capon among his co-mates of the poultry-yard.

DOMESTIC GEESE.

Amongst the varieties of our common domestic goose, there is one which has, not a great number of years, been introduced to our island; and which, from its great size and capacity of carrying flesh, has taken a very high place in the estimation of the breeder. This bird is designated—

THE TOULOUSE GOOSE.

Originally, this fowl was imported from the Mediterranean by the Earl of Derby, and is known indiscriminately by the names of Mediterranean, Pyrenean, and Toulouse. It is principally remarkable for its vast size, being perfectly gigantic, and therefore to be regarded as a most valuable addition to the poultry-yards of Great Britain. Its prevailing colour is a slaty blue, marked with brown bars, and occasionally relieved with black. The head and neck, down to the beginning of the breast,

and the back of the neck as far as the shoulders, are of a dark brown; the breast is slaty blue, and the belly and under-surface of the tail are grey. The bill is orange-red, and the feet are flesh colour. This bird is supposed to be the unmixed and immediate descendant of the grey-lag. In its habits it resembles its congeners, but appears to possess a milder and more easy disposition. Of its other peculiarities, it may be remarked, that the *curl* of plumage on the neck comes closer to the head than in the common goose, and that the abdominal *pouch*, which, in other varieties, is attendant only upon age, exists in these birds from the shell. The white Irish goose is fully larger than the Toulouse.

THE CHINESE GOOSE.

A Cygnoides.—Of the Chinese goose there are three sub-varieties, each presenting striking points of difference, and yet sufficiently alike to justify their being classed together. These are—*The Hong-Kong*, which has a large horny knob on the bill and forehead. Its prevailing colour is grey, with a longitudinal stripe, of a deep brown, running above the back of the neck. The legs are of a red colour, whence it is sometimes distinguished as the "Red-legged China goose;" and has long been known amongst us as the "Poland goose." *The Black-legged Chinese Goose.*—Also knobbed, and usually with a *white edging* round the *knob*, somewhat similar to that of the wild breed called the "White-fronted goose." *The White Chinese Goose.*—A very handsome bird, knobbed like the rest, of snow-white colour, and with legs of a bright orange-red. These geese are all smaller than the Toulouse; but they are, nevertheless, very fine birds. The white variety, especially, with red legs, is very beautiful, and forms an appropriate ornament on a piece of water. The flesh is also good, and they feed well, fatten easily, and are very prolific. Of our ordinary domestic geese there exist but two sorts, the only distinction of which seems to rest in their relative size. They are divided into the *large* and *small*; and by some, according to their colour, into the *white* and the *grey*. These divisions are, to a certain extent, arbitrary; as out of one clutch, several varieties, both as to size and colour, will generally be found. The best sorts of geese, however, are those which vary least in colour. Those approaching most nearly to the primitive stock, are the birds which every good judge will prefer breeding from. *Grey* is the best colour, as coming nearest to the original grey-lag: white is not quite so good; but *mixed* colours are not so prolific, and the young are more difficult to feed up to the required standard. Markham says, "the largest is the best; and the colour should be white or grey, all of one paire; for pyed geese are not so comfortable, and black are worse."

In reference to mating the gander, it is observed by Mr. Richardson, "that this entirely depends upon the object which the breeder has in view. If eggs are wanted, one gander is plenty for six or even eight geese; or he may abandon the *unnecessary* trouble of keeping a male at all, and only occasionally send his geese to his neighbour's. It so happens, however, that keeping geese for the produce of their eggs alone is not profitable; and hence these must be rendered duly fertile. To effect this, one gander to a large number of geese will not answer. For the purpose of hatching, a gander should be mated with, at most, four geese. If of the ordinary kind, amongst which colour varies, he should be of a pure white, or ash-grey colour; but not at all of *two colours*. His dimensions should be large, his gait active, his eyes lively and clear, his voice ever ready and *hoarse*, and his demeanour full of boldness. The goose should be chosen for her *weight of body*, steadiness of deportment, and *breadth of foot*—a quality which indicates the presence of other excellences. In one season the goose lays from ten to twenty eggs; and, should she not be desired to sit, by removing the eggs as fast as she lays them, and at the same time feeding her highly, she may be induced to continue laying to the number of forty-five, or even fifty. This is, however, unusual, as well as unprofitable. When tolerably well looked after, geese may be made to lay, and even hatch, three times in the year. When this is desired, the plan to pursue is only to feed highly, and house them well, and early in the spring, so as to have the first brood soon in March; but we would rather have two good clutches reared than three bad ones; and therefore recommend patience and moderation."

The goose will begin to lay about the latter end of February, or the beginning of March. The commencement of her laying may be readily discovered, by noticing her running from one place to another, carrying straws in her mouth. This is for the purpose of forming a nest, when she should be watched, lest she drop her eggs where they cannot be found. On this account Mascall recommends trying the geese *manually* over-night, and confining such as are ready to lay. When a goose is shut up, and lays her first egg in any particular nest, no further trouble need be taken with her, for she will continue to lay in that spot, and will not be likely to stray elsewhere.

When the inclination to hatch discovers itself, the nest should be made of straw, with a little hay as a lining, and should be so formed that the goose will not throw the eggs over the side when in the act of turning them. There is no necessity for banishing the gander. On the contrary, he may be suffered to remain as near the nest as he chooses, and he will act the part of a guardian. Fifteen eggs will be found sufficient for a fair-sized goose to properly cover; and they should not be touched during incubation, or the goose interfered with. As she is heavier than the hen, her food and drink should be left rather nearer to her than is necessary with common poultry, because, if she chance to absent herself from her eggs so long as to allow them to get cool, she may abandon the process of incubation altogether. It is, however, not necessary to mix either vinegar or pepper with her food or water, as some recommend, or in any way to meddle with her. The necessary period of incubation is one month; but the early-hatched goslings must be removed, lest the more tardy be deserted. About the twenty-ninth day these begin to chip the shell; and, should their own capabilities prove inadequate to their liberation, aid should be rendered them. The eggs should all, as nearly as possible, be of equal freshness, that they may be hatched at one time. On the appearance of the goslings they should be turned out into a sunny walk, if the weather will permit; but they should not be made to feed for twelve hours, at least, after leaving the shell. Their food may then be bread soaked in milk, boiled greens, curds, porridge, or even bran, mixed with boiled potatoes; and care must be taken that the food is not given in too hot or too cold a state. Avoid exposing them to rain or cold breezes; and be particularly careful that the walk into which they are turned is sheltered both from wind and weather. The goslings should also be kept from water for at least two days after hatching, lest they become affected with cramp —a disease which frequently proves fatal to them.

Geese should be confined as little as possible, and should be kept in an inclosed yard, sufficiently large to admit of their having plenty of room for walking about; and if there is a common in close proximity, they should be allowed to stroll about and shift for themselves. This will considerably lighten the expense of keeping them. They require water, and cannot be advantageously kept when they are deprived of it; still, however, they may thrive without having access to any pond or river, if they have only a small artificial pool in which they may bathe themselves. When geese are within range of water, and suffered to roam at large, they usually discover it, and afterwards daily resort to it. Though they are so fond of water, their sleeping-places must be kept perfectly free from damp. Grass is as necessary to them as water; and the rankest, coarsest kind, such as cattle reject, constitutes their delicacy. Such grasses as they prefer will be found on swampy lands, of which, perhaps, no more profitable use could be made. The stubble-field is, when it can be obtained, also an excellent walk for geese; for they not only find the young grass and herbage springing up amongst the stubble, but likewise pick up much corn that would otherwise be lost

Goslings, produced in June or July, will fatten without other food than such as the stubble-field may yield, as soon as they are ready to consume it; but if required to be brought up by a given time, potatoes, turnips, or other roots, bruised with meal, should be given at least once daily. The goose is very voracious, and only requires to get plenty to eat in order to accumulate fat. Geese, fed principally on grass and corn, do not, perhaps, attain the same bulk with such as are crammed; but their fat is much sweeter, and they are altogether much more desirable

for the table. Early geese require home-feeding, as they have no stubble-fields. London feeders, therefore, when they receive goslings from the country, about March or April, feed them first with meal from the best barley or oats, made into a liquid paste, and subsequently with corn, to give greater firmness and consistence to their fat.

Geese are fattened in large numbers in some places of the European continent. This is especially the case in the neighbourhood of Strasburg—a place celebrated for its pies. There geese have a shepherd to tend them as sheep have. The birds are reared by the peasantry, every one of whom is possessed of some stock of these valuable fowls; and the shepherd, every morning, wakes the echoes of the village by the sound of a trumpet, with which he assembles his feathered flock, which, in the company of a herd of pigs, repairs to pasture on the common devoted to that purpose. In the evening, the shepherd leads back his flock; but, before they arrive at the village, almost all the geese take flight, rise above the roofs, and settle down in their respective homes. They flap their wings, cross, and fly against each other in the air, uttering a cry not unlike the note of a hoarse trumpet, and presenting an animated scene to the delighted villagers.

Towards autumn the peasants carry to town their finest birds, and occupy a place in the market, which is so large as to furnish a very great number with plenty of accommodation. One hundred and fifty thousand geese annually pass through the market of Strasburg. The woman who fattens them is acquainted with those peasants who come from where the best geese are produced. She fingers the bird to assure herself that the body is well formed; examines the foot and beak, to determine its age; then makes her bargain, and carries home her purchase. When she returns, she places the goose in a separate compartment, and feeds it with marsh-beans. As soon as it is considered sufficiently strong to undergo the process of fattening, this is begun. The pupil passes into a higher class, and is fed with maize, steeped in salt water. From this time the feeding is regular and forced. It is admitted, now-a-days, that geese ought to be fattened without exercise; therefore they are packed, about thirty together, in a stable, and, during the last eight days of the fattening, they are placed in a cage open at the top. It is the skill of the trainer, in this latter period, that determines the success of the operation; and as it is necessary to kill the bird just at the time when the liver will remain white and firm—night and day must this favourable moment be watched for. The following is the manner in which the fattening process is carried on:—The feeder places the goose between her knees, and holds the wings fast, whilst the feet are left free. With one hand she holds the beak open; with the other she drops the grains of maize into the throat, and pushes them home with her fore-finger. This operation is gone through regularly thrice a-day. One woman alone cannot cram more than twelve geese an hour. An estimate of the labour may be made from the fact, that 200 geese are often trained by the same feeder. The bird being killed, plucked, and disjointed, the feeder hangs it up in an airy place; and not until twenty-four hours have elapsed can she judge of the condition of her treasure. She then takes down the bird, and carefully effects the extraction of the much-esteemed liver, which is immediately taken to the pie-makers, who make of it the well-known pies. Matthieu, the cook of Cardinal de Rohan, was the first who suggested the use of the liver of the goose for pies. Success crowned his efforts; and from that period the fattening of geese became a trade. It is by the feeding of geese, that the wife of the mechanic, who is deprived of work in the winter-time, supports her family. Other women, who have a little capital, carry on feeding on a larger scale. The business is a very arduous one. The woman has to rise two or three times in the night, and inspect her stock; geese, during the latter period of their feeding, being subject to apoplexy. This dreadful watch-woman marches about with a sharp knife, to cut the throat of the first which shows symptoms of suffocation. Every goose that dies against rules, occasions to its owner a clear loss of more than 6*s.*, besides labour and time. A goose costs from 2*s.* 6*d.* to 3*s.* in the market; and, on an average, it consumes, in food, about 2*s.* 6*d.* Killed in good condition, it ought to weigh from 6 to 7 lbs., and is worth about 6*d.* per lb. It yields, besides, 1 lb. of fat, worth

about 10½*d.*; the offal fetches 3*d.*; the feathers and down about 1*s.* 2*d.*; making a total of 5*s.* 8*d.* All the profit, consequently, is derived from the liver, which is sold, according to its size and quality, from 2*s.* 6*d.* to 4*s.* 6*d.* The value of the liver is said to depend, like beer, chiefly on the quality of the water.

POULTRY-HOUSES.

Previous to the laying-in of a stock of poultry, a house must be made ready for their reception, or more harm may be inflicted on them than will ever be repaired, by setting them to roost in a cold place, or cooping them up in what may be called little better than a hole, where the heat of their bodies engenders an atmosphere at once deleterious and destructive. A poultry-house may easily be erected, and at very little cost. In nine cases out of ten, some outhouse, without preparation or alteration, is appropriated to the poultry; but, if consistent with the owner's means and position, a proper house should be constructed. If this be done, a piece of gravelly soil, well drained on a slight declivity, near trees which will afford shade from the sun, and shelter from winds, should be chosen. The building must be sufficiently high to admit the poultry-keeper without stooping, and the roof should be kept weather-tight. Thatch is warm and ornamental, but apt to breed vermin. If, therefore, slates or tiles are employed, the house should be ceiled, in order to protect the fowls from draughts and sudden changes of temperature. In the absence of lath and plaster, a piece of patent asphalted felt, closely nailed, forms both a cheap and efficient protection.

The best perch is made in the shape of a broad double ladder, and in such a way as to form a wide angle—the bars being placed so far apart, that one fowl shall not overhang another. If roosting-bars are so placed as to run across the fowl-house, care should be taken that a convenient hen-ladder is attached to them, and that they are not placed too high. Perches, if lofty, and unaccompanied with a ladder, are dangerous to the heavier fowls, as they frequently break their breast-bones in descending by flight from them. After the fowls have taken up their roosting-places for the night, the poultry-keeper should see that they are all comfortable, and not too crowded, with sufficient room for the weak ones to remove themselves from the strong, which are apt to peck them. The floor must be sound, dry, and strewed with fine gravel or sand, and it should be swept clean every day. Nothing injures the health of fowls more than bad smells. A basket of slaked lime or cold mortar ought always to be kept in a corner, with a shovel, so that it may be shaken over any droppings. For the same reason, the interior walls should be frequently whitewashed, and the window opened in fine weather. The door should have a hole at the bottom, with a sliding panel to admit the poultry during the day; and if there are no windows, movable loose boards, fitted to the door, may be useful to admit air. As warmth is very requisite to poultry, one side of the poultry-house, if it can be done, might stand against the outside wall of a kitchen or boiler-house; or a hot-water pipe, running through it from the hot-house, will well repay the outlay. With a sweet, warm, clean poultry-house, a good supply of eggs may be expected as the result.

In reference to the nests, the great object should be to have them near the ground, that they may be easily cleaned, and of moderate size. If they are too large, two fowls will often try to sit in one nest at the same time; and if there is any difficulty in getting at them, hens are apt to drop their eggs on the ground. Nests may be made of wood, unglazed earthenware, or basket-work. If of the first, there should be a small ledge to prevent the eggs from rolling out. A little old mortar, or wood-ashes laid at the bottom, will tend to keep the nests clean. Straw and heather both make good lining for nests; but the latter must be cut into short lengths. Should the nests be arranged in two storeys, there ought to be a broad ledge, sufficiently wide for a hen to walk on, in front of the top row, and a hen-ladder should be placed at each end; but nests are better on the ground. It is of some advantage to have fowls that are sitting placed in a retired situation, where they will not be annoyed by the others, and where, when the hatch takes place, they can be cooped with their young, out of danger, with a dry yard, or close-cropped lawn in front to run on. Many hens, as well as pea-fowl and turkeys, are

vicious, and will try to destroy a rival brood. A small brick hutch, about a yard square, with a hard dry floor, and a movable wooden top, is excellent as a *sitting-room* for hens. Before a fowl is put to sit, the nest should be made perfectly clean; for if the hen becomes infested with vermin, she pines, and cannot sit close. Should the stock comprise more than one breed of fowls, and should the races be intended to be preserved pure, they must, as a matter of course, be kept separate.

"Where this is attempted," says Mr. Richardson, "an inclosure adjoining the poultry-house, with three divisions of iron wire, if the space can be spared, will be found useful. In these inclosures, in wet cold weather, the poultry can be confined, with room to scratch and feed. The largest division will be for laying hens and turkeys, and miscellaneous stock. In this space you can muster them, accustom them to be fed, see that all are in health, and make the close observations which are needful for success. In the second, you can place hens with young broods, before they are strong enough to mix with the other fowls. In the third, and smallest, you can keep poultry for fatting. If the accommodation is large enough for them to enjoy the air without being able to run about much, with shade, sun, plenty of clean water and food, they will generally thrive better than when cooped. A few good coops, either of wood and wire, or wicker, with the top thatched, should always be at hand. These may be made so as to shut up the chickens, if necessary, as well as the hens. If the fowl-house is large enough, have a small hollow sunk in one corner where there is light, and fill it with fine sand or ashes, slaked lime, or burnt oyster-shells, as a dust-bath for the fowls. If it is not, place in the yard, under cover, a large glazed earthenware pan. By placing the dusting material in a pan, it is easily changed from time to time. If you are obliged to put up with a small lean-to, or other confined place, for your fowl-house, at any rate take care to keep it clean; for warmth, cleanliness, and judicious feeding are the cardinal maxims for poultry management."

THE COTTIER'S POULTRY-HOUSE.

Under the head of "Housing," we have already observed, that the best mode of rearing fowls, is the old plan of allowing them to roost on the rafters of the room in which the cottier keeps his fire. Owing to the warmth thus afforded during winter, when eggs are scarce, and consequently at a high price, they are to be obtained from the humble cabin, when they are not to be got from the less *warm* poultry-house of the more affluent breeder. Let us repeat, however, that should circumstances render the keeping of poultry in the cabin unadvisable, a comfortable house may be erected for them against the outside of the cabin wall. If possible, the part of the wall against which the little hut is erected, should be that opposite to the fire-place within. If shelter is required, it can be obtained by means of a few bushes, or a wall of sods; and the neighbouring roads will serve as an ample walk; whilst the nearest stream will slake their thirst. A few laying-nests may be placed in a warm corner of the cabin. By such means as we have stated, the poultry of the poor cottier will thrive as well, and yield as great a profit, as those kept in the best-appointed establishments in the kingdom. Indeed, we are not certain that they will not thrive better; simply because the artificial means adopted to nourish and preserve them, is of a less complicated kind than such as are employed by the more affluent. Nature is left much more free to carry on her own operations; and as she is usually the best nurse of the bird, she generally performs her duties with an unerring certainty as to results.

CHAPTER VI.

THE DISEASES OF FOWLS, AND THEIR TREATMENT.

As the poet Burns has affirmed that the best-laid schemes of mice and men "gang aft ajee;" so may it, with equal certainty, be affirmed, that the strongest, as well as the weakest of animated beings, are the subjects of occasional disease. From this penalty incident to life, fowls are no more exempt than other animals; consequently, when the poultry-keeper sees one of these beginning to droop, or to fail in appetite, it is better, at once, to have it dressed for the table. If, however, it is of great value—perhaps a Spanish cock, worth more than a sovereign—a trial to save its life should be made.

The most common diseases to which fowls are liable, are the following:—

ACCIDENTS.

When these show themselves in bruises, loss of feathers, fractures, ulcers, &c., they may, in most cases, be left to nature. When bones are broken, however, the patient had better be consigned to the cook; but in less severe cases of accident, common sense will generally dictate the remedy.

ASTHMA.

This disease is accompanied by panting, gaping, and difficulty of breathing, and is usually caused by the sudden and frequent change of weather which takes place in this country. Poultry, having originally been brought from warm climates, still inherit the natural love for heat, transmitted to them by their progenitors, and are, notwithstanding the feathery covering with which nature has provided them, easily affected by climatic influences; and hence the colds, catarrhs, coughs, and consumptions to which they are subject. For asthma, the treatment recommended is warmth, with small doses of hippo powder, frequently repeated, and sulphur mixed with butter.

CONSUMPTION.

This disease is pronounced incurable; but a change of air and warmth is recommended.

CORNS.

These may generally be extracted with the point of a penknife. Should weight have brought them to an ulcerated state, a little lunar-caustic may be applied to them with success

COSTIVENESS.

When this occurs, change the diet, and let it be given more sparingly than usual. Thin porridge is good. For a cure, give a little castor-oil with burnt butter.

DIARRHŒA.

This disease is usually caused by damp and improper food. Therefore change the diet, and have the fowl taken into a dry place. Should the disease become very severe, administer chalk, and a little starch, mixed with cayenne in porridge, and give it a little warm.

FEVER.

In all febrile affections to which fowls ar frequently subject, give castor-oil, with a little burnt butter. Also, let the birds have a change of air, if possible, with light food, and not much of it.

GOUT.

Administer pellets of colchicum. Sulphur may also be found useful.

INDIGESTION.

This is caused by over-feeding and want of exercise. Administer powdered gentian and cayenne in the food, of which the usual quantity should be lessened. With this regimen let the fowls have an open walk to run in.

INFLAMMATION OF THE TRACHEÆ.

The disease to which this term is improperly applied, is an inflammation of the tail-gland. The symptoms are—difficulty of breathing, dimness of sight, constant gaping, and total loss of sight; a discharge from the nostrils, that gradually becomes purulent and fœtid;

also loss of appetite; but thirst remains, to the most aggravated extent. Sometimes this disease appears to occur independently of any obvious cause; but dirt, too hot feeding, and want of exercise, are amongst the most usual.

The remedies recommended are various. Mr. Martin prescribes one grain of calomel, made up with bread into a pill; or, if preferred, two or three grains of Plummer's pills (*pil. hydr. Submur. co., Lond. Pharm.*); after which let flower of sulphur be administered, to which add a little ginger, with mixed barley-meal reduced to a paste, and the mouth well washed in a weak solution of chloride of lime. In the meantime, let the bird be kept in a dry, warm, well-ventilated apartment, separate from the other fowls. When the bird dies of this disease, the trachea will be found swarming with narrow worms about half an inch in length, imbedded in slimy mucus. The worms are the *distoma lineare*—a long and short body united; the long body being the female, the short the male. They are permanently united; otherwise they are quite perfect in themselves. Mr. Martin is uncertain whether these worms are the cause or consequence of the disease; but it is certain that when they have once established themselves, their removal is necessary to give the bird a chance of recovery. This is sometimes done by means of a feather, neatly trimmed, and introduced into the windpipe. It is there turned round once or twice, and then drawn out. This will dislodge some of the worms if dexterously performed, and with some knowledge of the anatomy of the parts. A cock, in the last stage of roup, was cured by washing its mouth and nostrils with soap and warm water; its eyes with warm milk and water; and the internal application of pellets, consisting of "barley-meal and flour (equal parts), with mustard and grated ginger (equal parts), and half the above." Its drink consisted of lukewarm water sweetened with treacle. An acquaintance of the Rev. Mr. Dixon gave spirit of turpentine in rice, and afterwards a little salt in the water given them; he thus saved sixteen out of twenty chickens attacked with this disease. Mr. Richardson's treatment is, for pellets—Powdered gentian, one part; powdered ginger, one part; Epsom salts, one-and-a-half part; flower of sulphur, one-half part; made up with butter, and given every morning. If the discharge should become fœtid, the mouth, nostrils, and eyes may be bathed with a weak solution, composed of equal parts of chloride of lime and acetate of lead. Fomentation with an infusion of camomile flowers is also highly beneficial. The other affection—that improperly passed under this name, viz., swelling of the tail-gland—may be treated as a boil. If it become inconveniently hard and *ripe*, let the *pus* or *matter* out with a penknife, and it will soon get well.

Mr. Tegetmeier first announced, in his writings, the efficacy of certain local applications, in some stages of roup; and a person of the name of Homer, we think, first gave the solution of copaiba. This was administered through a quill; for where so given, it becomes, to a certain extent, a local application also; inasmuch as the fowl usually makes a coughing or a sneezing effort after it is given. The caustic potash, spirit, &c., used in forming the solution, seems to increase its efficacy as a local agent. For this purpose, Fauk's solution of copaiba is as good as any. It is readily given by means of a quill; which should be shaped like a blunt-pointed pen, or rather a scoop, for the facility of pouring the solution into it. The plume, or top of the quill, should then be cut off, leaving a circular aperture. On this end the fore-finger should be placed; the solution poured in at the scoop end, and well inserted in the bird's mouth above the tongue. The fore-finger should then be raised from the other end, when the contents of the quill quickly flow into the fowl's throat. As all are not equally informed, we shall be pardoned for stating, that there is a difference between balsam of copaiba and solution of copaiba; the latter being, in some respects, weaker, as it is prepared from the former. But the ingredients used in preparing the solution are, themselves, of efficacy, especially from their local action. But we must warn fowl-keepers not to expect that catarrh or roup in fowls is now to be "cured in one minute," as some peripatetic "doctors" vouch for the tooth-ache. These diseases seem often to be as depressing and lingering in fowls, as influenza or inflammatory sore throat is with ourselves.

The treatment frequently found most speedy and beneficial, is, first to give a dose of

powder jalap, made into a bolus, the size of a filbert or nut. The dose may be repeated twice or thrice every third day. Give a large quilfull of the solution of copaiba every night; that is, about a teaspoonful. In bad cases, we should give it night and morning, especially to large fowls. When the eyelids are swollen and gummed up, besmear them with an ointment, made from half an ounce of spermaceti and five drops of Goulard's extract. If this cannot easily be procured, or is not at hand, a little softened tallow from a candle, spread on the eyelids, greatly prevents their being gummed up. Such is good treatment. Everybody knows that the birds should be kept warm and dry; and we cannot too strongly protest against all effluvia and want of attention to cleanliness and ventilation. Let it always be remembered, that when these are not attended to, they are more frequently the cause of what are usually termed colds, and roupy attacks, than even cold and rain.

INFLAMMATION OF THE LUNGS

Is attended by quick breathing, with a rattle, an audible dulness, disorder of plumage, vacancy in the eye, and general indisposition. We know of no cure recommended for this disease.

INFLAMMATION OF THE HEART.

A fatal disease among poultry, and only detected by examination after death. The patient appears to droop; refuses to eat, retires to roost, and is found dead in the morning. In this case, the peritoneal membrane exhibits indications of active inflammation. This complaint is more peculiar to parrots, and caged birds of that description.

INFLAMMATION OF THE MUCOUS MEMBRANE.

This generally proceeds from aggravated diarrhœa. Damp and improper food is the cause of the disease. The remedy, to be successful, must be administered early. First, give a small quantity of castor-oil; afterwards, give doses of *hydrargyrum cum creta* (*Lond. Pharmacopœia*), with rhubarb and laudanum, as follows:—*Hydr. cum creta*, three grains; rhubarb, two or three grains; laudanum, two, three, or four drops; mixed in a teaspoonful of gruel, and given twice a-day.

MOULTING.

Moulting can hardly be called a disease, but, as it takes place annually in birds, and is very dangerous to young chickens, it is necessary to notice it. With full-grown fowls, warmth and shelter from the inclemency of the weather, are usually sufficient to preserve them from any evil consequences, if fed with an extra degree of nutritive and stimulating food. This treatment is recommended, from the fact of Nature causing the wild birds to moult at the very season when they have food in greatest plenty; which may be safely taken as a sign that good food is necessary to them at this time. After the third year, the time of moulting becomes later and later; and in proportion as this happens, so the degree of warmth should be supplied. Two or three grains of Cayenne made into a pill, with bread, may be given them. Sometimes the feathers will fall off fowls when they are not moulting, which is caused by a cutaneous affection similar to the mange in dogs. The treatment for this disease is such as we have recommended for animals so affected, in the preceding divisions of this work: and which are alteratives; such as sulphur and nitre, in the proportions of one quarter each, mixed with fresh butter; a change of diet, cleanliness, and fresh air in addition to this, will generally be found sufficient to effect the cure. Care should be taken not to confound this infection with moulting. The distinction is, that in the latter case, the feathers are replaced by new ones as fast as they are cast; in the former, this is not so, and the animal becomes bald.

PARASITES IN FOWLS.

The insects which infest poultry are particularly obnoxious, and the utmost possible cleanliness, and frequent lime-washing and fumigation, are necessary to keep them away. Mr. Richardson says, that "a correspondent of the *Agricultural Gazette*, had a beautiful brood of black Spanish chickens hatched. Taking one in his hand on the second day, he was much struck by observing on his poll five or six full-sized lice (*Goniocotes hologaster*), evidently caught from the mother. All the brood were

similarly affected. Some white precipitate powder, applied with a small camel-hair pencil, was sprinkled over them, and the day after the parasites had disappeared;" nor could he discover one during their after-growth. This powder must be used in very small quantities.

Like the domestic fowl, the peacock has also its parasites in the *Goniodes pulciornis*. "After the death of the bird," says Mr. Denny, in the *Monograph Anaplurorum Britanniæ*, "the insect may be found congregated in numbers about the base of the beak and crown of the head." This gentleman was afterwards induced to examine all the genera of domesticated birds; and he found on the turkey, *Lipeurus polytrapezius* as a common parasite: the *Goniodes stylifer* is also frequently in the head, neck, and breast. Over the domestic fowl he found three species of parasitic *Goniodes dissimilis*, of rare occurrence. *Lipeurus variabilis* preferring the primary and second feathers of the wing, among the ribs of which they move with great celerity. *Menopon pallidum* he also found in great abundance; and, as a general rule, he observed, that when two or more species frequented the same description of bird, each had its own locality. The remedy in all cases is cleanliness (when the fowls are over-infested), fumigation, and a plentiful bath of clean, dry, and rough sand: for the white precipitate powder, named above, is poisonous, and only fit to be used on very young birds, which have not yet learned the art of preening their feathers with their bill.

PIP.

This disease, to which young fowls are extremely subject, exhibits its symptoms in the affected birds having a thickening of the membrane of the tongue, especially towards its tip, and, by-and-by, a gasping for breath, when the beak will often be held open. The plumage becomes ruffled and neglected, especially about the head and neck. The appetite gradually lessens; and the bird shows its distress by pining, moping, and seeking solitude and darkness. The cause of all this is want of clean water, and from feeding too much upon *hot exciting food*. Dr. Brehst in considers it to be analogous to the *influenza* of human beings. In treating for it, most writers recommend the immediate removal of the thickened membrane. Mr. Martin has suggested that the tongue be cleansed by applying a little *borax*, dissolved in tincture of myrrh, by means of a camel-hair pencil, two or three times a day. Mr. Richardson would rather anoint the part with fresh butter or cream. Prick the scab with a needle, if you like; and give, internally, a pill about the size of a marble, composed of equal parts of scraped garlic and horseradish, with as much cayenne pepper as will outweigh a grain of wheat. Mix this with fresh butter, and give it every morning—keeping the fowl warm. Keep the bird supplied with fresh water; preserve it from molestation, by confining it to itself, and you will generally find it get well, if you have taken the disease in time.

ULCERS.

These may be kept clean by being dressed with a little lard, or washed with a weak solution of sugar of lead, as they appear to require it. If the ulcers seem sluggish, they may be touched with *bluestone*, in order to accelerate their action, and bring them more speedily to a healthy state.

Such are the principal diseases to which poultry is subject; and which, whenever they make their appearance, should be attended to with as great promptitude as those which afflict animals of much higher value to mankind. If fowls are kept, they should have every attention their condition requires. Humanity, if not interest, demands this; and it is very frequently the case, that precisely in proportion to the attention given them, their beauty is developed, and their value enhanced.

DIVISION VIII.

PRINCIPLES AND PRACTICE OF MODERN ENGLISH FARMING.

CHAPTER I.

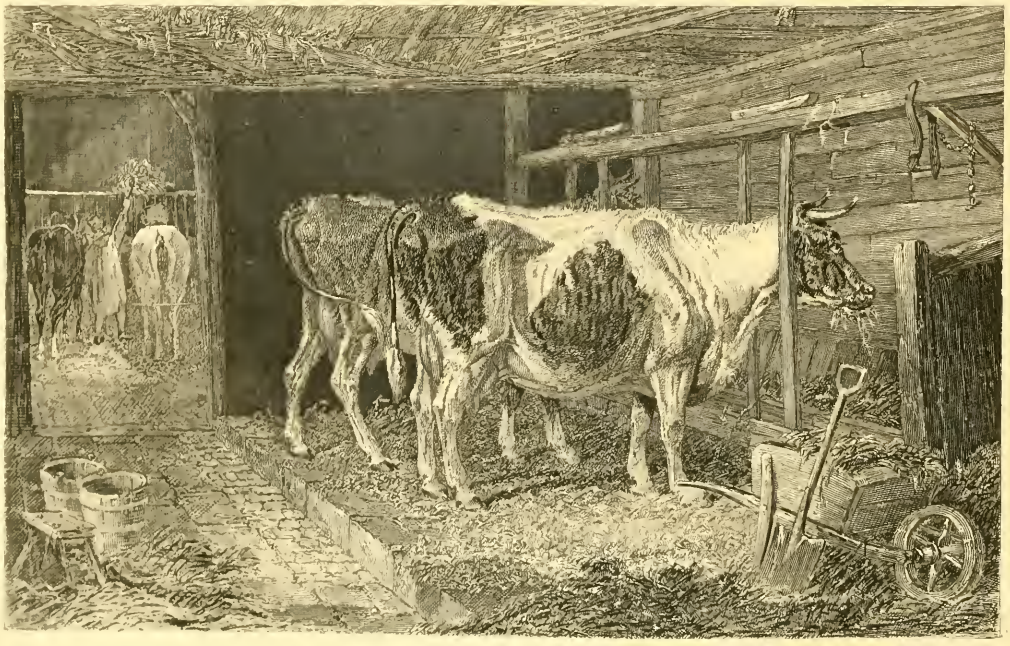
LINES OF COMMUNICATION; NECESSITY OF LABOUR; THE FECUNDITY OF WEEDS; AGRICULTURAL EDUCATION; THE LITTLE SMITHFIELD CLUB; TURNIP CROPS; THE ROTATION OF CROPS; ARTHUR YOUNG; THE EARL OF LEICESTER; ARTIFICIAL FATTENING.

LINES OF COMMUNICATION.

"Of all inventions," says Lord Macaulay in his *History of England*, "the alphabet and the printing press excepted, those inventions which abridge distance have done most for the civilisation of our species." Every improvement, he adds, of the means of locomotion, benefits mankind morally and intellectually, as well as materially. Of the truth of this remark, every one who has, whether from pleasure, choice, or business, had to traverse the primitive *cuttings* of a British colony in its semi-infantine state (as the present writer has had to do), must be conscious. There, as a general rule, there is nothing but difficulty to the traveller. If his excursion is commenced in love, he soon finds that it must be prosecuted with toil; and if he set out with the intention of viewing the country, he discovers that he must first see through the wall of an interminable forest, the immediate trees of which extend their branches over his head, and, for the greater part of his journey, shade the narrow way upon which he is proceeding, even, in many instances, to the shutting out of the light of the sun. He does not proceed easily and gaily over the smooth and level surface of a macadamised road, but over a sort of mud swamp, hardened—when it may happen to be hard—by the broken and decaying branches of the neighbouring trees; presenting no other sign of an approach to civilisation than that of its having been rudely cut by the hand of man. It is evident that where there are difficulties of this kind in the way of communication between different parts of a country, its progress must be slow indeed towards the goal of an advanced civilisation.

The earliest maker of roads, of which history has given us any information, was an Egyptian Pharaoh, who, by forced labour, constructed a gigantic causeway, to enable his workmen the more easily to convey materials for the erection of a useless pyramid, which has certainly immortalised his folly, notwithstanding that the name of the founder is a subject of doubt. Herodotus has handed down to us the cruel edicts which this despot passed for the purpose of compelling the unfortunate creatures subjected to his power, to carry out his fanciful caprice, and the curses with which they loaded his memory. On this remote effort at road-making, however, it is here unnecessary to dwell, when even road-making, especially through the most populated parts of Great Britain, has, in a measure, been put out of fashion, in order that railway-making may apparently take its place. But it must be long, if it is ever to take place, before the railway can be made subservient to the requirements of every portion of an agricultural district. There, if farming is to thrive, good roads must still be preserved in a state of repair. "It is well known," says Sir John Sinclair, "that the best cultivated districts are those which possess the greatest facility of internal communication, without which agriculture languishes in the most fruitful soil; and, with it, the most ungrateful soil soon becomes fertile." The truth of the last clause of this sentence is remarkably verified when we look at the effect which the

HARROWING WITH OXEN.



COW HOUSE.

expansion of our railway system has had in stimulating the farming operations of the country. "For several years past," says a well-informed writer on this subject, "all the railway companies have agreed to convey live-stock free, and implements at half their usual charges, to and from the shows of the Royal Agricultural Society; the railway companies, at the towns where they are held, generally providing accommodation for the mechanical compartment. This, at Chelmsford, cost the Eastern Counties Railway Company upwards of £3,000. Railway fares and pace could alone bring the number of shilling-paying strangers who contribute to the enormous expense of these exhibitions. The population of the city of Salisbury, including men, women, and children, amounts to 10,000; but the visitors to the show, in 1857, were over 35,000. This is of itself a striking proof of the wide and eager practical interest which is felt in agriculture, for there is little to gratify the eye of mere holiday-gazers; and when, in addition, we consider the mountains of coal, iron, timber, artificial manure, lime, and chalk conveyed in the one direction, and live-stock and corn in the other, we cannot help coming to the conclusion, that George Stephenson's locomotive has been the great cultivator of the farmer's mind and the farmer's land—the great agent for the extraordinary advance which British agriculture has achieved in the last quarter of a century. Very significant were the figures given by the chairman of the above company at the Chelmsford dinner, when he told his farmer friends, that, in the course of the preceding twelve months, the lines over which he presided had conveyed 24,000 tons of guano and other portable manures; 700,000 quarters of grain; 550 sacks of flour; 71,000 beasts; 380,000 sheep; 13,000 tons of meat and poultry; and 43,000,000 quarts of milk!" This was ten years ago; and, as population has since greatly increased, and agricultural appliances considerably multiplied, we may fairly presume that these figures have increased in amount to a proportionate extent. Well may the writer exclaim—"Who can calculate the value of the many rewards held out to breeding, feeding, and corn-growing, in the shape of four thousand miles of railway! and how little are men, who live in the midst of these changes, conscious of their magnitude until the results are collected and put on paper!"

THE NECESSITY OF LABOUR.

If a person enters upon the operations of farming, he must not expect that he is beginning a life of idleness. In the mere fecundity of the weeds upon his fields, intermingling with his crops, he will very soon find the truth of the original sentence passed upon Adam, and thus written in Milton's *Paradise Lost*:—

> "Cursed is the ground for thy sake; thou in sorrow
> Shalt eat thereof all the days of thy life;
> Thorns, also, and thistles it shall bring thee forth
> Unbid."

Nothing can be truer than this, for ill weeds grow apace. As the crop ripens, so do they; therefore there is a constant vigilance, accompanied with labour, to keep them down, or rather to eradicate them from the soil, in which they seem to find such a congeniality of conditions, that they appear literally to love it with an enduring and inseparable affection. Sir John Sinclair, however, considers these wild and spontaneously-growing children of the soil as a positive advantage. Strange if this is really the case, when every farmer complains of them, and labours at their extirpation. No doubt Providence has supplied them for something more than merely that of cursing the ground. "What," says Sir John, "is the inference from the fact, that couch-grass and thistles can by no means be extirpated? Is it not perpetual exertion, fallowing and agricultural labour? Some may be inclined to say, 'A melancholy reflection!' But I say, No! not at all. Providence could not have better contrived than that exertion should be perpetual, and that *success* should be in proportion. There is not a weed that we ought to wish out of our fields, unless we remove and destroy it; because if there were none, or very few, all fields would be clean, and no praise could light on superior modes of tillage. Some may say, again, 'So much the better!' But I say, *No!* Does any man think that our various soils would have been sufficiently pulverised and worked, had there been no enemies of this sort to challenge forth our labours? Sterility would have seized upon our turnip lands, which are only con-

tinued in a state to bear their rotations of crops, by the necessary periodical renewals of their fertility. The necessity of subsistence produces industrious hands for every department of labour; but the sluggish nature of man requires every stimulus to exertion. The weeds of the fields excite emulation among farmers; and foul fields are always a reproach to the occupier. Thus we are compelled, by an unseen hand, to better habits and more active industry."

This reasoning, we fear, is more specious than sound, as there are thousands of flower-gardens entirely destitute of weeds, and yet possessing soils perfectly pulverised. We have heard even of kitchen-gardens being so completely denuded of weeds, that it was deemed necessary to *cultivate groundsel*, for the humble purpose of feeding a solitary pet bird. Whatever may be the providential purpose of weeds, however, toil is as necessary to eradicate them, as tillage of the soil is necessary previous to its reception of the seed for a valuable crop. We profess to small knowledge, indeed, of the meanings of the ways of Providence; but that weeds will multiply rapidly and indefinitely, without they are rooted out, is a fact which comes within the experience of every farmer, and which, without any effort of memory, is daily brought within the range of his observation upon his own grounds. Pliny tells a story which will bear quoting, as it strikingly shows the value of labour when nicely applied to the objects of agriculture. "I cannot forbear stating," says he, "one instance from old times, from which we may perceive both that questions of culture were brought judicially before the people, and also how men of that time were in the habit of defending themselves. C. Furius Cresinus, a freeman, became the object of much ill-feeling on the part of his neighbours, in consequence of his gathering, from a very small field, much more produce than they could procure from very large ones. He was accused of attracting the crops from other fields by charms. Sp. Albinus appointed a court day to hear this charge; and Cresinus, fearing that he might be found guilty, when the tribe were about to pronounce their verdict, brought his live and dead stock into the forum; and he brought with him a stout wench, and Piso says that she was in good case, and well clad. His iron implements were exceedingly well manufactured; the spades were strong, the shares powerful, and the oxen in high condition. Then he said, 'These, Romans, are my charms; but I cannot show you, or bring into the forum, my mental labours, my vigils, nor the sweat of my brow.'" Here are some of the great secrets of good farming—strong and willing labourers, good implements, long watching, and hard labour.

THE FECUNDITY OF WEEDS.

What is a weed? is a question much more easily asked than answered. For example, every person at all conversant with fields and flowers in this country, would be loth to consider the *dandelion* as a specimen plant, suitable to take its place in the garden; yet has this very plant been *lionised* in Australia. It has there formed one of the attractions at a flower show, and was the means of drawing thousands to gaze upon its charms. Dr. Johnson defines a weed to be "an herb noxious and useless"—a definition more brief than true. In his *Book of the Farm*, Mr. Stephens says—"When any plant is found growing where it should not be, it is a weed. For example, a stalk of wheat in a bed of tulips in a garden, is a weed, and should be removed; and, in like manner, a tulip in a wheat-field is a weed, and should be eradicated." This is just saying that it is a fruit or a flower out of place. The author of the article on "Weeds," in Morton's *Cyclopædia of Agriculture*, says—"Every plant different from the crop, and growing with the crop, to its hindrance, is a weed. Regarded in this light, most of our wild, and even cultivated plants, may take the place of weeds: thus potatoes, left in the soil, may completely smother a succeeding crop; or the shed seeds of a former crop may germinate amid a new one; and, in both cases, their removal by weeding will be necessary to success." This is sufficiently clear and comprehensible for the farmer's view of the subject; and as weeds are certainly greatly obnoxious to good cultivation, it may not be amiss to show here the wonderful fecundity with which they are endowed. Professor Buckland, in an article in the *Agricultural Gazette*, says

that "the Crow-garlic is a liliaceous plant, the scape or flower-stem of which is as much as from two to three feet high, rising from a bulb, which, especially in non-flowering examples, will be surrounded by from four to eight smaller bulbs or *bulbels*. The original intention of the scape is to bear the flowers, after the manner of the garlic and onion of our garden; but it curiously happens that, instead of flowers, the scape is surmounted by from one to three compacted heads of minute bulbs, possessing the structure and characters of those at the base of the plant, and endowed with such a power of vitality, as to be, in most cases, *viviparous;* that is, growing or sending out leaves before they fall from the parent stem. These are sometimes, but very rarely, mixed with flowers; and as they readily and singly separate from the parent as its stem becomes dry, they become scattered around, and take possession of the soil. Thus a whole colony, in one season, results from a single plant.

"Thus, then, we see that the Crow-garlic, if allowed to seed, has a prodigious method of increase; but we must recollect that this increase is not, like the majority of weed-plants, by seeds which are agreeable to birds and insects, by which means many much more productive plants are kept in check. On the contrary, it would appear to be avoided by all classes of those creatures; whilst the bulbels themselves, which are seldom abortive, possess such wonderful powers of vitality, that they may be kept like onions, or the ordinary flowering bulbs, for months, and, perhaps, even years, and still maintain their germinating power."

The importance of this subject must be our apology for the length of this quotation; but it makes it clear, that the farmer who does not know that the principal means by which the Crow-garlic is multiplied is through the bulbs, has done but half his work in the destruction of the weed, if he allows these still to exist. Facts of this sort necessarily suggest the value of a knowledge of botany to the farmer, especially when the operation of weeding alone, on an acre of arable land, costs the yearly sum of from five to twenty shillings. An old rural rhyme says that—

"One year's seeding
Is seven years' weeding."

And the truth of the maxim it embodies will be apparent from the following table, drawn up from several hundreds of observations, stretching over a period of five years, in different parts of England, and under the most varied conditions of geological formation and modes of farming:—

Table of the Fecundity of Weed-Plants.

Trivial Names.	Botanical Names.	Number of Seeds to a Plant.	When Collected.
Black Mustard	Sinapis Nigra	8,000	August 17.
Charlock	Sinapis Arvensis	4,000	September 18.
Shepherd's Purse	Capsella Bursa-pastoris	4,500	September 9.
Hedge Mustard	Sisymbrium Officinale	5,400	October 13
Cow Parsnip	Heraclium Spondylium	5,000	August 17.
Fool's Parsley	Æthusa Cynapium	6,000	August 17.
Red Bartsia	Bartsia Odontites	4,800	October 1.
Dandelion	Leontodon Taraxacum	2,040	October 1.
Hardhead Scabious	Centaurea Scabiosa	4,000	September 10.
Nipple Wort	Lapsana Communis	8,400	September 23.
Stinking Chamomile	Anthemis Cotula	40,650	September 23.
May-weed	Anthemis Arvensis	45,000	October 14.
Burdock	Arctium Lappa	24,520	October 1.
Sow-thistle	Lonchus Oleraceous	19,000	October 1.
Groundsel	Senecio Vulgaris	6,500	September 10.
Musk-thistle	Carduus Nutans	3,750	October 13.
Corn Cockle	Agrostemma Githago	2,940	September 8.
Common Campion	Lychnis Dioica	3,125	October 1.
Common Dock	Rumex	13,000	September 15.
Red Poppy	Papaver Rhœas	50,000	October 19.

Such is the astonishing fecundity of weed-plants. Of 21,950 seeds of the following weeds, upwards of 6,000 have been found ripe in April, when hoeing is frequently carried on. The grey speedwell, ivy-leaved speedwell, shepherd's purse, hairy bitter cress, chick-weed, and groundsel. In the very process of hoeing, then, these are scattered about under the most favourable circumstances for growing; and, if the hoeing is, for some little time, deferred, or not done at all, the 21,950 will, in all probability, by next season, have taken entire possession of the soil. The manner in which weed-seeds are propagated are, first, by the neglect of way-sides and waste places; second, from permitting weeds to be thrown on the manure heap; and third, from sowing weed-seeds with the seeds for the crop. To these circumstances, therefore, the farmer should be particularly attentive.

AGRICULTURAL EDUCATION.

Of the necessity of an agricultural education, independent of his other scholastic acquirements, for the young or rising farmer at the present day, no one of the slightest intelligence has the smallest doubt. The customs of our grandfathers are already old and effete; whilst those of our fathers are fast wearing out. In a lecture delivered by Mr. Morton, at the Royal Agricultural College, he laid down these three points as essential to the young farmer:—1st. That he should have practical skill. 2nd. That he should have business tact. 3rd. That he should have a liberal and scientific education. This gentleman showed that, if a man possessed a merely practical skill, and nothing more, he was little better than a labourer; that if, added to his practical knowledge, he had business tact, he might not only be a labourer, but become the manager of a farm; but that, without having, in addition to capital, a liberal and scientific education, he was not fitted to hold a large farm in the present day. This subject is a most important one. We ourselves are acquainted with several young gentlemen, the sons of farmers, who have been boarded out to receive what is called a liberal education; and they have gone home to follow the occupation of their fathers, with as much of the kind of knowledge necessary for such an object, as a watchmaker may be supposed to have for the manufacture of a steam-plough or a threshing-machine. Their case, however, is by no means singular. At a meeting of the weekly council of the Royal Agricultural Society, in April, 1861, the subject of agricultural education was introduced by Mr. Holland, M.P., and discussed. Among the authorities quoted upon this subject was Mr. Wilson, of Edington Mains, the author of *British Farming;* who, in respect to the rising young farmers, gives his opinion in the following terms:—

"The mere possession of capital," he says, "does not qualify a man for being a farmer; nor is there any virtue inherent in a lease to insure his success; to these must be added probity, knowledge of his business, and diligence in prosecuting it. These qualifications are the fruits of a good education in the fullest sense of the term, and are no more to be looked for without it, than good crops without good husbandry. * * * But the great difficulty, at present, lies in finding appropriate occupations for such youths between their fifteenth and twentieth years. In many cases, sons of farmers are, during that period, put to farm-labour. If they are kept steadily at it, and are made proficient in every kind of work performed on the farm, it is a good professional training, as far as it goes. The more common one—at least as regards the sons of the larger class of farmers—which consists of loitering about, without any stated occupation; attending fares and markets, and, probably, the race-course and hunting-fields, is about the most absurd and pernicious that can well be imagined. Such youths are really to be pitied, for they are neither inured to bodily labour, nor afforded the benefits of a liberal education. It need not surprise any one that such hopeless lads often prove incompetent for the struggles of life, and have to yield their plans to more vigorous men who have enjoyed the benefit of bearing the yoke in their youth. Unless young men are kept at labour, either of mind or body, until continuous exertion during stated hours, confinement to one place, and prompt obedience to their superiors, have ceased to be irksome, there is little hope of their either prospering in business, or distinguishing themselves in

their profession. Owing to the altered habits of society, there is now less likelihood than heretofore, of such young persons as we are referring, to, being subjected to the arduous training to bodily labour, which was once the universal practice; and hence the necessity for an appropriate course of study to take place. * * * It is also common for such youths to be sent to Edinburgh for a winter or two, to attend a class of agriculture, and, perhaps, also of chemistry and the veterinary college. This is well enough in its way; yet there is wanting in it an adequate guarantee that there is real study—the actual performance of daily mental work. * * * After enjoying the benefits of such a course of training as we have here indicated, young men would be in circumstances to derive real advantage from a residence with some experienced practical farmer, or from a tour through the best-cultivated districts of the country."

Enough to show what the present age requires in the young farmer to rise or be successful in his profession.

THE LITTLE SMITHFIELD CLUB.

In order to come clearly down to the present, we must look a little way into the past. In 1798, the Duke of Bedford, Lord Somerville, and several others, with Arthur Young as honorary secretary, formed the "Little Smithfield Club," with the view to the exhibition of fat stock at Christmas-time. A specification of the food upon which each animal had been kept was to be given, and prizes were to be competed for. This society has wonderfully grown in strength, and has rendered incalculable service to the interests of agriculture, by making known the kinds of food most favourable to the rearing of cattle for meat, and by educating both the grazier and the butcher up to the knowledge of the best form of animal. In 1806, a toast of Mr. Coke, of Holkham, afterwards Earl of Leicester, was—"Small in size, and great in value." But notwithstanding the far-sightedness which, even at that time, in the face of great proclivities, he exhibited in his judgment of cattle, the tallest ox continued to take the prizes. Long legs have long been reckoned a serious fault, as they are the most profitless parts of the beast. In 1850, a little Devon ox, of an egg-like shape, which is the modern *beau-ideal*, gained the Smithfield gold medal, in competition with gigantic short-horns, and Herefords of elephantine proportions; and, in 1854, a large animal of Sir Harry Verney's was passed over without even the compliment of a commendation, because he carried on his carcase too much offal, and more threepenny than ninepenny beef. The Smithfield Club is now a great institution, bringing annually together all the best breeders and cattle-judges in the country.

TURNIP CROPS.

In order that the improvement of cattle might extend generally, as far as possible, throughout the country, and not mostly be restricted to rich grazing districts of the midland counties, it was felt that some addition to the usual supply of food was necessary. Already had the finest, most productive arable land of the kingdom been exhausted, by the years upon years of cultivation it had undergone; whilst the barren fallow, which annually absorbed one-third of the soil, was inadequate to the task of restoring its fertility. In this emergency a new source of agricultural wealth was discovered. Turnips sprung into notice, and were received with a sort of general enthusiasm in the farming districts. They were found to answer the purpose of a fallow crop, which cleaned and rested the old arable land; they were excellent food for fattening cattle in winter; and when raised on light land, and afterwards eaten down by sheep, which pressed the soil into firmness with their feet, led the way for corn crops on wastes which had before been hopelessly assigned to the rabbits. By this means the heaths and wolds of Yorkshire and Lincolnshire, with some assistance from marling and the travelling sands of Norfolk, Nottinghamshire, and Bedfordshire, were gradually recovered and peopled by the race of farmers, who have been first to adopt all the improvements in English agriculture for the last century. The new system, however, required capital in both the landlord and the tenant. From the landlord, it required barns and yards, and houses suitable to the wants, habits, and tastes of first-class men, with high means. But when

the spirit of improvement takes possession of a class or people, neither proper men nor plenty of means will be wanting to realise the objects in view. Mr. Coke, of Holkham, expended over £100,000, in twenty years, on dwellings and offices alone. This sum, however, was by no means unprofitably laid out; but whatever sums the new system required to be expended by the landlord, it also demanded a proportionate expenditure on the part of the tenant. It required him to lay out a large sum on flocks and herds, and, above all, in labour, for years, before the wild land began to return a profit. We are told, that a Mr. Rodwell, in Suffolk, sunk £5,000 in merely marling 820 acres, with a lease of only twenty-eight years. The value of his produce, during that period of his occupancy, was £30,000 greater than the twenty-eight years preceding his improvements. Speculations of this kind required no mean degree of intelligence to conduct them, and no small amount of spirit to enter upon them; yet they seem generally to have been crowned with success.

Turnips are said, by Young, to have been brought into farm cultivation by the celebrated Jethro Tull, and found an ardent advocate in Lord Townshend, who, in 1730, retired from taking part in public affairs. After this, he devoted the remaining eight years of his life to the improvement of his estate. It is said that he originated practices which increased the produce not only two but a hundred-fold, and from which the country still continues to draw the benefit. In England, the practice of marling and claying farms was far from being new. Indeed, it was very old. In the reign of Elizabeth, Harrison, in his *Description of Britain*, says—"Besides the compost that is carried out of the husbandmen's yards, ditches, and dove-houses, or out of great towns, we have with us a kind of white marl, which is of so great force, that if it be cast over a piece of land but once in three-score years, it shall not need of any further composting." The usage, however, died out; and seems not to have been again recovered until Lord Townshend and a Mr. Allen applied it to the sands of Norfolk, and converted immeasurable acres of rabbit-warrens and sheep-walks into rich soil. At the close of the last century, Young estimated that three or four hundred thousand waste acres had been reclaimed and turned into gardens, and rents rose from sums varying from a sixpence and two shillings an acre up to fifteen and twenty. Marling, however, would not, of itself, have reclaimed the wildernesses of Norfolk; it required the assistance of something else; and that was found in turnips. Townshend had the sagacity to perceive that this was to be the parent of all future crops. Without a supply of food through the winter, a limited stock must be kept, and this could yield but little manure, without which profitable farming was vain. "The turnips were, therefore, employed to secure a large dung-heap; and the dung-heap, in turn, was mainly appropriated to securing the largest possible store of turnips. This tillage, in a circle, was as productive as it was simple. The ground, cleaned and enriched by the root-crop, afterwards yielded abundant harvests of corn; and as has already been observed, the treading of the sheep upon the loose soil, while they fed off a portion of the turnips, gave it the necessary firmness. Thus, through the agency of the turnips, a full fold and full bullock-yard made a full granary." Essex and Suffolk soon followed the method, although they did not proceed in it so far as they did in Norfolk; and, in many parts, the turnips were never thinned or hoed, upon which their dimensions, and, consequently, the largest portion of their value, depended.

To the reader of the ancient agricultural writers, it will seem strange how it was that, for so many centuries, the value of the turnip was not perceived by the farming mind, when its qualities were, at least, tolerably known eighteen hundred years ago. Pliny tells us, that no crop is so valuable except grasses and corn. He also says (we quote from an article of *Ancient Agricultural Literature*), "That they are most wholesome food for man, and excellent, dressed in a variety of ways; that they keep through the year, either potted or when mixed with mustard; that they are most valuable in ornamental cookery, as capable of receiving six colours besides their own, one of the colours being purple—a quality possessed by no other kind of food; that, when boiled, they will feed fowls, and that the leaves are good for cattle; and, finally, that he has seen

one 10 lbs. weight." Columella says, that "in Gaul, the bulbs are used as winter food for cattle and sheep;" showing that the ancient fathers of our neighbours across the Channel were not ignorant of the value of the turnip, in supplying their flocks and herds with nourishing food throughout the long, dreary months of the winter. Nor is marling a discovery of the moderns, for it seems to have been, both in Gaul and Britain, a staple practice in husbandry. Pliny recommends six different kinds of marl used for pulverising the soil. Some were of a clayey description, which were used for light ground; some sandy, for heavy. Some were of a rocky sort, which preserved its form till several years of the effects of sun, rain, and frost reduced it to amalgamate with the soil. Some lasted ten, some thirty, and some fifty years. Some were got at in a day: and one kind which endured eighty years, and which no man had ever been known to apply twice to the same land, was obtained in Britain from narrow pits, dug to a depth of thirty yards.

THE ROTATION OF CROPS.

The course of Roman agriculture, with some partial exceptions, was of the simplest description—a crop of grain and a fallow. Every year one-half of the arable land was in grain, and the other half in fallow. A third of this was sown with a green crop of some kind, to be given to the cattle; and this was the only portion of the fallow that received the benefits of manure. The result of this mode was, that the arable land was manured once in six years; and, in that period, produced three crops of grain, and one of green stuff. This system, by degrees, wore out the land. It took the very heart out of it, so to speak; so that, in the time of Varro, a great falling-off had taken place in the returns for the quantity of seed sown. Fifty years later, Cicero gives an account of the rich Sicilian lands, and claims $2\frac{1}{2}$ bushels to the statute acre. This, well cultivated, seems to have yielded eight or ten for one, equal to twenty or twenty-five bushels respectively. In another half century, Columella tells us, that over a large part of Italy, the instances are few in which the return is more than four to one; and the increasing lamentations over the penury with which the land returned its grain for the seed, as we descend in the series of authors, are in entire accordance with the paucity of their crops.

In England, during the last century, the rotation of crops was viewed as the special characteristic of the husbandry of Norfolk. Until past the year 1750, no just ideas upon the subject seem to have been formed in any part of the kingdom; in proof of which, Sir John Sinclair makes the remark, that all courses were thought to be alike, and meriting neither censure nor praise. The established rule upon which the farmers of Norfolk acted, and to which they doggedly adhered, was never to take off the same ground two corn crops in succession. But this formed only one rule or part in the whole of a valuable system. They had not discovered the importance of alternating grain with other products of the soil; but they had perceived and found the advantage of following turnips with barley; this with clover; and this with wheat. They had discovered that the fibrous roots of the clover were the best possible pabulum for the nourishment of the wheat, and that nothing else answered so well. By 1767, Young found this four-course system widely prevalent, the principal variation being in the duration of the clover, which some farmers permitted to remain for two or three seasons previously to its being broken up for wheat. All these changes occurred during the thirty years between 1730 and 1760; but, with slight exceptions, they were entirely confined to Norfolk; and it was not till Young made his appearance upon the scene, that they began to penetrate into other districts.

ARTHUR YOUNG.

One who did so much, in his time, to enlighten the agricultural mind of this country when it was involved in a cloud of thick darkness, merits some notice in these pages. The reclamation of barren sheep-walks; an improvement in the different breeds of live-stock; an increase in the quantity of food grown on arable land for their support; and a better rotation of crops, are the principal events which distinguish the progress of English agriculture during the last century. After some advances had been made, the next step was to demolish those obstructions which

kept the farmers of that day apart from each other, and which held them in the bonds of ignorance as to what was passing in every district beyond the immediate limits of their own, as complete as if they were so many Robinson Crusoes, doomed to cultivate a piece of solitary land, on a solitary rock, in the middle of the Pacific. The man who entered heartily into this work was Arthur Young, the son of a prebendary of Canterbury. A writer describes him as one of the most useful and sagacious, if not one of the most brilliant of men. Long before his time, however, Norfolk was celebrated for the superiority of her roads. The inhabitants quoted with pride an observation of Charles II., who said that the county ought to be cut up to make highways for the rest of the kingdom. This, however, only proved how deplorable, in this respect, were the other parts of the country. When Young made his "tours," and visited Norfolk, he did not fall-in with a single mile of good road in it. In Essex, the lanes were so narrow that it was only possible for a carriage to get along them. "Ruts," says the writer already quoted, "of an incredible depth; and chalk-waggons stuck fast, till a line of them were in the same predicament, and it required twenty or thirty horses to be tacked to each, to draw them out one by one. The thoroughfares, in fact, were ditches of thick mud, cut up by secondary ditches of irregular depth. In attempting to traverse them, Young had sometimes to alight from his chaise, and get the rustics to assist him in lifting it over the hedge. Such was the state of things when, in 1767, he abandoned the farm, in which he had experimented too much to be successful, and availing himself of the frank hospitality which has, in every age, been the characteristic of our farmers and country gentlemen, made those celebrated 'tours,' which are absolute photographs of agricultural England, and are models of what all such reports should be—graphic, faithful, picturesque, and philosophical!" Such was the man and his work, which did so much to impart an impetus to agriculture; and which, from his time to the present, has, without pause, continued to advance.

THE EARL OF LEICESTER.

Mr. Coke, of Holkham (afterwards Earl of Leicester), headed the agricultural movement towards the close of the last, and throughout the first quarter of the present century. Reclaiming the Norfolk wastes, marling the light lands, extensively cultivating the turnip, and introducing the rotation of crops, have all been ascribed to him. That he was the originator of all these improvements, however, can hardly be the case, as Young states, in his *Tours* (published some years before Mr. Coke held an acre in Norfolk), that every one of these practices were then in common use. But though the precise nature of what Mr. Coke did has been exaggerated or misunderstood, what he really did accomplish was very great. He is the first in the ranks of that class of whom Young wrote in 1770—"Let no one accuse me of the vanity of thinking that I shall ever, by writing, wean farmers from their prejudices. All improvements in agriculture must have their origin in landlords." Five years after this, Mr. Coke succeeded to the estates of the Leicester family; and here we find it stated, that "the fine house at Holkham, erected from the designs of Kent, about the middle of the last century, bears an inscription, which imparts that it was built in the midst of a desolate track; and its noble founder was accustomed to say, at once jocularly and sadly, that his nearest neighbour was the King of Denmark. There was still many a broad acre in its primitive sheep-walks; and Mr. Coke graphically described the condition of portions of the property surrounding this princely mansion, by the remark, 'that he found two rabbits quarrelling for one blade of grass.'" This was an unprofitable, as well as an uninviting, condition of things; but he was not disheartened. He immediately set about applying the known methods practised, to bring into a state of fertility the wilderness with which he was encompassed; at the same time adopting such improvements as suggested themselves on the existing modes. He also endeavoured to persuade his neighbours to adopt his practice. Having, by perseverance, labour, and example, succeeded in rousing them from the lethargy into which they had sunk from the success which had attended the practice of Lord Townshend, the second revolution commenced. The great evil of the time, as we have already observed,

was the isolation in which farmers lived. They were nearly as much fixtures as their houses; and what was done upon one side of a hedge was hardly known upon the other. "The Lord of Holkham instituted his annual sheep-shearing, at which he feasted crowds of guests from all parts, and of all degrees. Under the guise of a gigantic festival, it was an agricultural school of the most effective kind; for the social benevolence engendered by such magnificent hospitality disarmed prejudice; and many who would have looked with disdain upon new breeds of stock, new-fangled implements, and new modes of tillage, regarded them with favour when they came recommended by their genial host. * * * Excluded by his political opinions from public office, and the favour of the court, Mr. Coke found abundant compensation in the feudal state of gatherings, at which, as a contemporary journal records, hundreds assembled, and were entertained. Farming, hunting, or shooting in the mornings: after dinner, discussing agricultural subjects; whether the Southdown or new Leicester was the better sheep—whether the Devon or the old Norfolk ox was the more profitable. In dealing with those who farmed under him, he showed the same wisdom as in his own village. He formed an intimacy with Young, and acted on three of his maxims, on which agricultural progress may be said to depend—'that a truly good tenant-farmer cannot be too much favoured, or a bad one have his rent raised too high;' that 'good culture is another name for much labour;' that 'great farmers are generally rich farmers.' By these methods he raised his rental to more *thousands* a year than it was *hundreds* when he inherited the estate, and had enriched a numerous tenantry into the bargain. * * * The wealth, nevertheless, which accrued to himself was the smallest part of the gain. He was a national benefactor upon a mighty scale, and was the cause, directly and indirectly, of adding a countless mass of corn and cattle, of beef and mutton, bread and beer, to the resources of the country."

ARTIFICIAL FATTENING.

In 1824, from a suggestion made by Mr. Blackie (the steward of Mr. Coke), Mr. John Hudson, of the farm of Castle Acre, entered upon the experiment of supplying his young wethers with oil-cake and sliced turnips. What, in the last century, would have been thought of such an act? He would have been pronounced mad, and in a condition suitable only to become the inhabitant of a lunatic asylum. But what was the result? When Mr. Coke asked to see the produce of his tups, he found that they had been sent to market twelve months before the usual time. Yet even the neighbours of Mr. Hudson, and even his own father, a man of intelligence and agricultural progress, prognosticated his ruin from his extravagance in purchasing food for sheep. Now, however, the buying of linseed-cake, or meal, or foreign pulse, is one of the regular means by which an increased quantity of meat is *grown*. Wherever turnips are raised and sliced, there the cake-trough is to be seen; and the improved material for feeding, united to the natural tendency of the best breeds to arrive at an early maturity, has increased, to an amazing extent, the quantity of mutton in the kingdom. It is affirmed, by Mr. Morgan, that, twenty years ago, the majority of sheep brought to Smithfield market were three and four years old; and to find a score under two, would have been a matter of some difficulty. And now a three-year-old sheep is scarcely to be met with; whilst fat sheep, no more than a twelve-month old, are abundant. Thus, independent of the vast increase in the numbers kept, three generations of sheep are fed and fattened for our tables, in the same space of time in which one was prepared in 1838. But purchased food would have been almost thrown away on the former species of tardy-growing animals. Applied, however, to the improved stock, reared on the principles of Bakewell, it has created a demand, not only for tups from Sussex, steers from the Quantock hills, and oil-cake from Germany, but for new implements and machinery of almost every agricultural description.

For some time the Leicester breed of sheep was preferred by Mr. Coke; but he subsequently replaced them with the Southdowns. These he considered superior; and the bringing of them to the high state of perfection in which they are beheld by the present genera-

tion, was accomplished by Mr. Jonas Webb, and arose out of one of those trifling circumstances from which great results often emanate. His grandfather was a breeder of rams in Norfolk; and it was one of the oddities of the old gentleman, at his annual sales, to put his grandsons to ride on his tups, without saddle or bridle, but making them hold fast by the immense horns of the animals. Experiencing both the pain and the difficulty of retaining his seat on these occasions, it suggested itself to the mind of Jonas, that, if ever he arrived at manhood, and bred sheep, he would endeavour to provide them naturally with "better saddles of mutton." A lean hurdle-backed Norfolk ram was at this time the animal; which, indeed, might have better racing qualities, but could not compare, in eating qualities, with the beautiful firkin-bodied Southdown, for which Mr. Webb refused 500 guineas at the Paris Exhibition of 1855. Nothing but Norfolk sheep could have thriven upon the uncultivated Norfolk heaths of former times; and nothing but the roots of artificial grasses, the cake, and the corn of modern days, could have brought the Babraham "Downs" to their present state of matchless perfection.

We have now arrived at the period when Norfolk is no longer foremost in the race of agricultural improvements, and when the new era commences in the foundation of the Royal Agricultural Society of England, incorporated by special charter.

CHAPTER II.

THE ROYAL AGRICULTURAL SOCIETY; DRAINAGE; THE FIRST FIELD DRAINED; THE CHEMISTS; PORTABLE MANURES; THE GEOLOGISTS; THE GAINS OF FARMING.

THE ROYAL AGRICULTURAL SOCIETY.

The source of the present mode of farming dates from the foundation of the Royal Agricultural Society, in 1837-'38. The late Mr. Henry Handley, M.P., has the merit of having suggested the formation of this association, in a pamphlet which he published in 1837, and which seems, very rapidly, to have carried conviction to the minds of those who became the originators of the society. Mr. Handley was a Lincolnshire squire; an excellent judge of stock, and a good sportsman; whilst he cultivated his own estate, it is said, with a higher degree of intelligence than was usual in his time. The first meeting of the association was held at Oxford, in 1839; and the first number of its *Journal* appeared in the following year. It was placed under the editorship of Mr. Philip Pusey, who died in 1854, who was a good writer, an ardent farmer, and who devoted his time, his talents, and his fortune to recording the progress of his favourite science, and stimulating improvements in every direction to which his influence extended. He is said to have been an example of "that delightful combination of scholarship and practical energy which is so common in England; and he exercised the double influence of an accomplished gentleman and an enlightened agriculturist."

It is impossible to calculate the benefits which have been conferred on English agriculture by the establishment of this society. The brightness of its own light has been diffused through the remotest corners of the land. In the able article from which we have already quoted, it is stated that, "with its council of peers, squires, tenants, and implement-makers; its professors of chemistry, botany, and veterinary art; its thousands of subscribers spread over every county of England; its journal of transactions and reports; and, above all, its annual encampments in the centres of successive districts, has done for farming what the great fairs of the middle

...ge ... for commerce ... concentrated and ... knowledge, brought customers and ... dealers into contact, and helped to ex... ... prejudices in the excitement of social ... They have carried to provincial ... the best live-stock, the best implements, ... the best cultivators. The influence of ... example, of competition, and even of rank and ... fashion, has been brought to bear on local ... Squires have been encouraged to ... improve their estates by the speeches of ... superior men; and young noblemen, in want ... of an object, have found it in agricultural ... duties. Implement-makers have had the ad... vantage of the suggestions of their customers, ... and, thus taught and teaching at the same ... time, have, every year, become more de... pendent on tenants, and less on fancy farmers."

As with every institution which is founded with great objects in view, and which meets with success, there always remains something which has not been fully foreseen, and which, in the course of time, gradually develops itself. Thus it happened that, when this society was founded, not one of the promoters foresaw the importance of the machinery department. In the ten sections of its charter of incorporation, explaining the objects of the association, implements have only an incidental reference, as one of the objects to which scientific men were to be stimulated to direct their attention, in a miscellaneous paragraph, which includes the construction of farm buildings, the application of chemistry to the general purposes of agriculture, the destruction of insects injurious to vegetable life, and the eradication of weeds. At Oxford, a few manufacturers perceived an opening for procuring customers, and found their way to the "show-yard," notwithstanding the difficulties from the absence of that kind of cheap conveyance which is now, happily, placed within the reach of the humblest member of the community at large. One gold medal for a collection of implements, three silver medals, and £5 for a paddle plough for raising potatoes, were all the rewards distributed in 1840, for what was destined to be the most attractive, as well as the most useful feature of the exhibition of the society. After the meeting at Cambridge, in 1840, the importance of the implement department was acknowledged; and the mechanical appliances displayed, beginning with some three hundred at Liverpool, in 1841, increased at the rate of about one hundred on every succeeding year; until, in 1853, at Gloucester, they reached their highest point in a total of two thousand. The rise and fall of a few hundreds chiefly depends upon the importance in railway facilities of the town where the "show" is held; and the number of implements exhibited is not so great a test of the progress of mechanical invention as of the sales which are likely to be effected in any particular district. The annual show is only one of the numerous ways which the manufacturers adopt to advertise and exhibit their ingenuity of invention, and beauty of workmanship, in producing their mechanical contrivances. The real prize to the maker is *the one* which brings to his establishment plenty of custom.

At the show at Bury St. Edmund's, steam-engines and barn machinery constituted the class of implements brought to the test; but one hundred acres of heavy land, and twenty acres of light land, were provided for the performances of the steam ploughs. Several new arrangements were made in the show-yard; among which we may observe that a fence encircled the horse-ring; and the horses which gained the prizes were distinguished by a set of numbers, similar to those which gave so much satisfaction at the Yorkshire show of 1866. The poultry show was revived, and £200 worth of prizes were distributed.

DRAINAGE.

When the Royal Society was founded there were about 400 local societies in existence; but they were associations formed rather for the encouragement of the social qualities of life, than for the promotion of the arts by the means of which the materials for eating and drinking are increased. The speeches delivered at these convivial "gatherings" were usually of a highly complimentary character; and the members congratulated each other upon the pre-eminence which distinguished their own enlightened district. They were, in short, associations apparently formed for no other purpose than that of maintaining local ignorance, rather than of obtaining additional knowledge from practical experiment and

experience. This is a lamentable truth; but we must now give our consideration to those especial improvements which have, during the career of the society, taken place in the agricultural parts of the kingdom. Amongst these, perhaps, the very first deserving of especial attention is drainage. From the earliest times attempts have been made to drain. We believe there are in existence specimens of clever workmanship in this art, upwards of a century old; but when it ought to be done, and why it ought to be done, and how it ought to be done, was never reduced to the simplicity of an intelligent practical rule. Whatever books there were upon the subject, were entirely destitute of principles. Lord Bacon, who possessed a large collection of works upon agriculture, had them, one day, piled up in his court-yard, and set on fire; for, said he, "in all these books I find no *principles;* they can, therefore, be of no use to any man." This we take to be one of the truest signs of his wisdom; and this was just the deficiency in all that had been done respecting drainage until, in 1843, Josiah Parkes undertook the task of explaining its *principles.* Two years later, he made suggestions which led to the manufacture of the steel tools which were necessary for forming the deep cuttings, as well as the cheap pipes, which were essential to carry off the water from them after they had been formed. Ten years previous to this, however, when draining a peat-bog near Bolton, in Lancashire, he made the discovery of the great effect which deep cuttings produced in relieving the soil of a certain number of inches of the water which, during a rainy season, is stagnant, and remains in that state until removed by evaporation in a dry season. Further experience brought him to the conclusion, that the shallow drainage advocated by Mr. Smith, of Deanston, about eight miles from Stirling, Scotland, was a vital error, and that four feet, which left a sufficient layer of dry, warm, surface earth, after allowing for the rise of the moisture by capillary attraction above the water-level of the drain, should be the minimum depth.

THE FIRST FIELD DRAINED.

On a farm near Bolton, Lancashire, belonging to a celebrated bone-setter, the first field was drained on the four-foot plan. From small beginnings, however, there often spring very large results. Accordingly, this was the commencement of the subterranean network of those pipes, which have more than doubled the value of our retentive soils. There was, however, still a great deal to be done. The proper tools had not yet been made, nor had a cheap conduit yet been discovered. But, in 1844, a Birmingham maker succeeded in manufacturing the cutting implements, which have gradually been brought to perfection; and, in the preceding year, at the Derby show of the Agricultural Society, a person of the name of John Reade, a gardener by trade, and a self-taught mechanic (well known as the inventor of the stomach-pump), exhibited cylindrical clay pipes, with which he had been in the habit of draining the hot-beds of his master. His method of constructing them was, to wrap a lump of clay round a mandril, and rub it smooth with a piece of flannel. Nothing could be more simple. It was seen by Mr. Parkes, who showed one of them to Earl Spencer; remarking, at the same time, "My lord, with this pipe I will drain all England." The council, on the motion of his lordship, awarded to John Reade a silver medal for his idea; and, in the following year, offered a premium for a tile-making machine. A great deal of money was wasted in attempts, and many patents were taken out for the purpose, but with indifferent success. At length, in 1845, a person of the name of Thomas Scragg, at Shrewsbury, received a prize for a machine which triumphed over the difficulties, and pipes can now be made as fast as the kilns can take them. From that hour the work proceeded at a rapid pace. In the following year, Sir Robert Peel, from the knowledge he had obtained in the management of his own property, passed an act, by which four millions sterling were appropriated towards assisting landowners with loans for draining their land, with leave to repay the advance by instalments extending over twenty-two years. Nearly the whole of this first loan was taken up by the Scotch, before Englishmen had made up their minds to take advantage of it. The four millions of government money, however, was comparatively small, when placed in juxtaposition with the sums supplied by pri-

vate enterprise, for carrying out an improvement which, on the worst class of wet land, gave evidence of its value by the realisation of immediate profits.

Besides the government encouragement given to the drainage scheme, there was another circumstance which greatly helped to promote the work. About the period when the system of deep draining was brought to perfection, the great landowners, being solicitous of encouraging their tenants, who were depressed by the approaching free trade in corn, made thorough draining the most fashionable improvement. The Norfolk sheep-folding rotation had accomplished much for light land; had brought the cultivation of roots to a high pitch, and proportionably increased the live-stock on every light-land farm. The proprietors of strong retentive soils were naturally anxious to follow in the path of their light-land neighbours, and to grow the roots which were seen to afford such high profits in beef and mutton; and deep drainage enabled them to realise these hopes and desires.

THE CHEMISTS.

Previous to the farmers, and the agriculturists generally, having become accustomed to the value of certain foreign manures which had been imported into the country, Professor Liebig suggested that the fertilising power of bone manure, which had already been used, would be increased by the application of sulphuric acid, and the consequent production of superphosphate of lime. This suggestion was not lost on some of our keen commercial speculators. Accordingly, the experiment was tried by a carboy of sulphuric acid being poured over a few bushels of ground bones, when Suffolk drills, charged with superphosphate and guano, were despatched through the farming districts of the country, to show to agriculturists, that if they desired to grow large root-crops, there was something necessary to be added to their immemorially-established favourite manure, which they designated by the name of "muck." We are told that one of the first to experiment upon the new manure, and then to manufacture it on an extensive scale, was Mr. Lawes, of Hertfordshire, a squire and scientific chemist. He was followed by Mr. Purser, of London; who, in 1843, began with a solitary carboy of sulphuric acid, which cost ten shillings; and frequently afterwards he purchased ten thousand carboys at a time. A few years later, Messrs. Dixon and Cardus, at Southampton, made a profitable speculation by a contract with the government of Buenos Ayres, for the exclusive right of exporting the charred flesh and ashes of joints of meat burned, for want of other fuel, on the treeless Pampas, to boil down the tallow. This animal refuse (the accumulation of a quarter of a century), when treated with sulphuric acid, is converted into valuable superphosphate. But, although every quarter of the globe, even battle-fields, were searched for bones, the supply was insufficient to meet the demand. It consequently became necessary that some new resource should be found, in order to keep down the price of those manures, become so scarce, and deemed so valuable.

PORTABLE MANURES.

Before 1835, farmers and agriculturists, in addition to farm-yard dung, or night-soil, used for manuring their lands, gypsum, chalk, lime, soot, marl, salt, saltpetre, rape-cake, and bones. The discovery of the fertilising properties of bone was made by accident, at a fox-hound kennel in Yorkshire. Generously strewed over the heaths and wolds of Lincolnshire, it proved to be the philosopher's stone, which converted rabbit-warrens and gorse fox-coverts into fields of yellow grain. A Mr. Nelson, one of the late Lord Yarborough's tenants, was wont to say, that he did not care who knew that he had made £80,000 out of his farm, by making use of bones before other people were acquainted with the manner of using them. But what proved to be a success in one parish, or field, frequently failed in the one adjoining; and sometimes the farm which had once yielded abundantly in return for a dressing of lime or gypsum, inflexibly refused to respond to a second application. More extraordinary still, the root-crop—the foundation of the famous Norfolk rotation, the Golconda of half-a-dozen counties—began to fail, devoured in infancy by the fly. This was startling enough; for, without the turnip, whence was the provender to come for sheep,

and winter-fed cattle? The philosopher, however, happily stepped in. He came to the assistance of the farmer, and, by his knowledge, relieved him from the difficulties by which he was encompassed. Nitrate of soda and guano were imported; and, as we have just shown, superphosphate of lime from bones was invented. Agricultural chemistry soon won the place of a practical or a profitable science, and the anomalies in connection with the use of lime, chalk, gypsum, &c., were explained by the joint exertions of the farmer and his new ally, the philosophical explorer and expounder of Nature's secrets—the chemist. Nitrate of soda was imported from Peru, and sold, in small quantities, by an agricultural manure-dealer, about 1835; and, in the same year, a cargo of guano was consigned to a Mr. Myers, a Liverpool merchant. The value of this manure proved immense. At first its merits were not credited by the farmers—a tardy race, and much given to incredulity in their own vocation; but the shrewd-witted dealers in artificial manures accepted the new article, and sold it, either in a pure state, or under a special name, mixed with less active ingredients. In 1843, a store, inferior to that of Peru, having been discovered on the Ichaboe Islands, off the coast of Africa, 1,100 feet long, 400 broad, and, on an average, 35 feet deep—the whole was removed before the end of 1844, and realised upwards of a million sterling. Three years before this, an article of forty-three pages, from the German of Dr. Charles Sprengel, appeared in the first volume of the *Journal of the Royal Agricultural Society;* in which, though every kind of animal manure was described, guano only received a passing mention as a curiosity; and no note, to supply the deficiency, was attached by the editor—so little was it then known to the most intelligent cultivators, and so rapidly had the knowledge of its value spread in the interval.

About 1851, an important addition to the portable manures was discovered by Mr. Odams, in the blood and garbage of the London slaughter-houses. This refuse had hitherto been thrown down the sewers, or upon dung-heaps; but, in 1858, it was contracted for, to the extent of upwards of nearly 800,000 gallons a year. Mixed with ground or calcined bones, and sulphuric acid, it is turned into a vigorous corn and root fertiliser, known to agriculturists as the "nitro-phosphate manure." The mere circumstance of these products becoming articles of sale, and not of home manufacture by the farmer, had the effect of greatly extending their use. The seller of artificial manures helped, in another way, the general movement, which was stimulating the whole of the agricultural mind throughout the kingdom. He made the discovery, that his fertilising stimulants were stripped of half their value when applied to wet or ill-cultivated land. "Hence," says the reviewer already quoted, "he became the eager advocate of thorough drainage, and that thorough preparation of the soil, which can only be effected by the best class of ploughs, harrows, horse-hoes, and clod-crushers. His customers would have been customers no longer, unless he could have convinced them that the fault was in themselves, and not in the goods. He argued to ears which had, at least, been opened, and prevailed without the assistance of the hedge-stake. A man grudged growing weeds on a fertile soil, for which he had paid hard cash; nor could a manure that cost £10 or £12 a ton, be refused the economy of a machine to distribute it carefully; and thus drill husbandry spread, led by pipe-drains from Norfolk, Suffolk, and Bedfordshire, into every county of England, and with it brought all the machines and implements required for a clean, rapid, concentrated cultivation."

THE GEOLOGISTS.

The chemists having performed their work, it remained for the geologists to do theirs. Accordingly, Professor Henslow, the botanist, had, in 1842, observed some nodules at Felix Stowe, on the coast of Suffolk; and, in the following year, collected a quantity of them, and forwarded them to a Mr. Potter, for analysis. The manipulation proved them to be fossils, commonly called coprolites, on the hypothesis that they consisted of the excrement of animals, and containing from 50 to 55 per cent. of phosphate of lime. From this discovery the professor might have realised a fortune; but professors of science are not proverbially shrewd in monetary affairs. The quarry of

coprolites was to be obtained at a common rent; and there were manure manufacturers prepared to pay for the information; but Mr. Henslow "did not consider such a course consistent with his position as a man of science and a clergyman." He was requested by Mr. Potter to keep silent for some months upon the subject, as that gentleman "wished to have the chance of availing himself of the discovery." Accordingly, he sent the results of his investigation to Mr. J. B. Lawes, who made the superphosphate, obtained from coprolites, the subject of a patent, which he, however, was not able to maintain. After this, beds of coprolites were discovered in Hampshire, Cambridgeshire, and Dorsetshire; and further investigations in Norway put Mr. Lawes in the exclusive possession of large beds of a mineral called *apatite*, rich in phosphates; of which he began to import whole cargoes, for his manufactory at Bow, near the English metropolis. The superphosphate of lime, however, produced from fossils, being much less soluble than those which are obtained from fresh bones, can only be applied when mixed in moderate proportions with the latter.

GREEN CROPS.

One of the best essays ever read on a matter of agricultural art, was delivered by Mr. J. K. Fowler, of Aylesbury, at the Midland Farmers' Club; the chairman, Viscount Sandon, very justly praising it as "quite a model paper, full of facts." Farmers are, on most occasions, twitted with their delight in "talking turnips," and the subject of Mr. Fowler's paper was the congenial one of growing green crops. Although tabular statistics and elaborate calculations were kept in the background, still Mr. Fowler, in his practical little treatise, has embodied as much sound information as *experts* in other branches of industry contrive to compress into their literary efforts. But we will not follow the thread of Mr. Fowler's discourse through the details of preparing seed-beds, sowing, weeding, utilising winter and spring vetches, rye, winter oats, trifolium, incarnatum, lucerne, rape, white mustard, and other crops, classed as green food for the summer and early autumn months. Neither is it necessary for us to describe his production and treatment of the various kinds of turnips, Swedes, Kohl Rabi, cabbage, and mangold-wurzel, classed as food for winter and early spring. The simple mention of this diversified list of subjects will show the wide range of agricultural produce treated of in a well-handled paper, on one single but important branch of the business of the farmer. Mr. Fowler's opening remark, however, merits attention. Very naturally alluding to the importance of maintaining the supply of animal food, he observed that the great point for consideration was, how to raise the largest quantity of vegetable produce for feeding the live stock, not upon grass farms, but upon arable or mixed farms? He believed that more stock and meat might be produced, acre for acre, on arable than on grass land; and, in discussing the subject, one gentleman observed—"He was glad to hear that Mr. Fowler thought the growth of green crops the foundation of British farming, because many of the farmers of the midland counties were disposed to place that foundation upon the plan of consuming a vast amount of corn by their cattle. This was like beginning to build a house with the chimney-pot. If, by the purchase of four shillings' worth of superphosphate of lime, Peruvian guano, or other artificial manure, they produced one ton of roots (which he held they could), and that ton was worth nine shillings by their stock, then the raising of their green crops must ever be the foundation of agricultural progress and improvement."

In concluding this division, we must acknowledge our great obligations to several articles in the *Quarterly Review*, which show a mastery in the treatment of agricultural subjects, highly creditable to that periodical.

DIVISION IX.

IMPLEMENTS AND MACHINERY OF ENGLISH FARMING.

CHAPTER I.

AGRICULTURAL PROGRESS.

Up to a very recent period, the history of agriculture, in this country, presented a very curious anomaly. A few facts were prominently exhibited; but the gradual progress of it as an art, a manufacture, and as a branch of commerce, was entirely unnoted and unchronicled: and an industrial occupation, the capital of which, even thirty years ago, was calculated at £217,000,000, had no history, no statistics, no representative in the law or the state—no board, no minister, no department; in fact, nothing. Yet, about a century ago, this country was doing a large trade as an exporter of corn. Between the years 1773 and 1793, there was a sort of "pivot period," when the exports and imports nearly balanced each other: a slow but steady inclosure of land, at the same time, began to mark the consumption of a gradually increasing trade and population; the price of wheat averaged 45*s.* per quarter; and rents were from 7*s.* to 10*s.* per acre; so that the price of a bushel of wheat was, in fact, about two-thirds of the rent of an acre of land. There was no account of the progress of inclosure during the century; but a committee of the House of Commons, in 1797, computed the total quantity at about 4,000,000 acres.

In the present century, there has been a definite record kept of inclosures, of population, of corn imported, of prices, and rent of land. From 1800 to 1810, the amount inclosed was 1,657,980 acres; the population of Great Britain having increased 150,687; while the quantity of wheat imported was 6,009,468 quarters. From 1810 to 1820, 1,410,930 acres were inclosed; the population increased to the extent of 1,978,523; but the imported wheat was reduced to 4,585,780 quarters. From 1820 to 1830, 340,380 acres were inclosed, and the population increased 2,161,495. In the next decennary period, from 1830 to 1840, 236,070 acres only were added to the cultivated soil, although the population increased by 2,249,648; while the imports gradually diminished. Thus, during the forty years, rather more than 3,500,000 of acres were added to the cultivated soil, against an increase of population to the extent of 6,000,000; while the foreign supplies did not amount, on the average, to three weeks' consumption in the year, calculated over the whole period. During this time the country had passed through some remarkable phases. While a large amount of acreage had been brought into cultivation, the circulation had been restricted to a metallic currency, and wheat had fallen from 78*s.* 4*d.*, at the close of the war, to 58*s.* 3*d.* And nothing but the steady increase of population, and the still more rapid increase of trade and capital, could have sustained cultivation at the point it had extended to; nor was this done without considerable reduction of rents, though to nothing like what they had been before the war. During the agitation for the repeal of the corn-laws, it was thought that the measure, if passed, would have the effect of throwing much of the land out of cultivation; but, on the contrary, Britain was beginning to present the opposite phenomenon of a population overtaking the resource of fresh inclosure, and compelled to have recourse to some other means for increasing the produce of the soil.

Just at this period, agriculture begins to

assume a different and most important aspect, four distinct elements at once conspiring to open up new resources. These were—the introduction of the use of guano; the publication, in this country, of the works of Liebig; the establishment of the Royal Agricultural Society of England; and the introduction of a new system of drainage. The two first of these elements may almost be taken together; for, though the manure had been discovered which has since effected a marvellous revolution, the prejudice was so great against it, that, but for the authority of Liebig's name, it might not have been admitted as a manure; or, in other words, the manure having come, a man was needed to answer the challenge; and that man was found in the distinguished Professor of Giessen, whose publications, if they did not initiate, at least drew attention to the important and new-sounding fact, that, the bulk of a plant not being derived from the soil, the bulkiness of a manure had little to do with its value. Nor must we omit to mention the important point subsequently established by Mr. Lawes; namely, that "the lasting qualities of farm-yard manure are, in a commercial sense, not an advantage; for it is getting back your money by instalments, instead of getting it back all at once. A great deal of your capital is placed in the land, where it lies dormant for a long time; but science can correct that evil, by enabling you to put the right manure in the right place."

With regard to the third element, perhaps it does not merit the same value in the category of agricultural elements; for high patronage gives no lasting prosperity: and we must not forget, that if any benefit has been derived from societies, in several parts of the country, these already existed, and still exist, to extend their influence in their particular localities. If the Royal Agricultural Society has done any especial good, the seeds were sown before it had been called into life; and it has only had the effect of giving a stimulus to agricultural pursuits, by summoning up a new race of potent genii, and setting them all at work for the farmer. This may be illustrated by the fact, that at the Society's first meeting at Oxford, in 1839, for the exhibition of agricultural implements, the entries were but twenty-two; while at Gloucester, in 1852, the number amounted to no less than 2,032. But this is an argument equally applicable to older organised associations, which have gone through similar changes. Drainage, the fourth element, has unquestionably been a principal cause of agricultural progress, and does not require illustration here. It may be observed, however, that there are two great heads into which agricultural improvement naturally divides itself; viz., the Chemical and the Mechanical—the former applying especially to the light soils, and the latter to the clays. It is, however, to the latter that we must chiefly look for any increase in the production, inasmuch as, on the lighter soils, the wheat crop occurs only once in the four-course system: whilst upon the clays, whether managed upon the six-course system, or upon the older three course shift, it is grown upon a larger odd mark, approaching to the ratio of a third, instead of a fourth, of the arable land, and is, therefore, looked to by the farmer as furnishing the profit which, on the light soil, is drawn from the wheat and barley crop together, besides a wider range of profit derived from the sheep flock. It seems obvious that the improvement of the clay soils to their utmost extent, is the special, nay, perhaps, the only means left to us for operating in any important degree to maintain the produce of wheat proportionately with our increasing numbers. Accordingly, it is by increased mechanical means that we diminish the amount of time required for bringing the land, after the crops, into preparation for the future crops. Much has, indeed, been done by improved implements; but the application of steam culture to the soil is the greatest agricultural feat of the day. The clays are thereby enabled to hold the race more evenly with the lighter soils; for the great inherent powers of the heavy soils then come in aid to counterbalance the easier working of the lighter soils. These remarks naturally lead us to speak of the MACHINERY OF THE FARM, under which general heading, we have introduced some articles which may not properly be called machinery, but which, nevertheless, take a part in the numerous appliances of the agriculturist, farmer, or husbandman. The whole of this division we have arranged alphabetically, as it gives greater clearness and facility of reference.

ASPHALTING APPARATUS.

This is an apparatus used for asphalt flooring, being well known as the best, cheapest, and most healthy flooring for barns. It renders every description of agricultural building impervious to wet, not liable to decay, and secure from the touch of vermin. The materials are cheap, and the cauldron used for it may also be used for boiling cattle-food. The price of 100-gallon size, with working-tools, is about £17.

AXLES AND WHEELS.

The naves of these wheels are of iron, cast on chills, by which the wearing parts become so hard as to resist the file; the spokes are of oak, and the felloes of ash. They are made by machinery, which, from the accuracy this gives, renders them superior to those made by hand. They are also durable, and run easy. Mr. Crosskill is both their inventor and maker; and upwards of 90,000 of them have been sold for various purposes, and sent to every quarter of the globe. Price, per pair, £8 5*s.*; if with tire, 3 by ¾ inch, £7 10*s.*; and 2½ by ¾ inch, £7. An improved set may be purchased for £10 11*s.* Four pairs of patent wheels and axles, fitted with naves cast on steel pins, have also been highly spoken of. The spokes are made of the best malleable iron, one end of which is cast into the nave, the opposite end having a box screwed firmly on to receive the felloe; the end of the spoke is let up into the felloe by an auger, thereby preventing the destructive mortice holes. The tire is shrunk on hot, in the usual way. Price, No. 1, one pair 4 feet 6 inches high, 2½ inches tire, 2¼ inches axle, £6 10*s.* per pair; No. 2, one pair 3 feet 6 inches high, 2½ inches tire, 2¼ inches axle, £5 10*s.*; No. 3, one pair 4 feet high, 2 inches tire, 1¾ inches axle; and No. 4, 1 pair 3 feet high, 2 inches tire, 1¾ inches axle, £12 12*s.*, with boxes to carry oil.

BARLEY HUMMELLER.

This implement is designed to separate the horns from the barley. It is fitted with revolving cutters and wire cylinder, so that it will take off the horns, and, at the same time, separate them from the barley, at the rate of about two bushels per minute. Its price is about £3 12*s.* One of these machines, invented by Mr. Holben, of Barton, Cambridgeshire, consists of an elevating apparatus, which supplies the corn direct from the dressing-machine, and a breaker, making nearly 300 strokes per minute, under which the barley passes in a thin layer, at the rate of from ten to twelve quarters per hour. Whilst this process is going on, it, at the same time, brightens and improves the samples, which are delivered perfectly free from awns. It is easily worked by a lad; whereas all other machines for the purpose require two men. The price is £5 10*s.*

BREAKING MACHINES

Are now very much in use. One, invented by Mr. Nicholson, of Newark, Norwich, has received high commendation, and was, at Chester, awarded the prize for being the best for common cake. It is made with Nicholson's patent method of driving the movable roller with an internal cog-wheel; thus obtaining an unusually great variation in size, broken in a simple and effective manner, and greatly diminishing the friction and power required to work it. Its strength and simplicity are further increased by a new and effective setting arrangement. The price is £3 13*s.* 6*d.* Another, manufactured by Messrs Aimes and Barford, received the first prize at the North Lincolnshire shows, open to all England, both in 1860 and 1861, in competition with all the prize machines by the best makers: it is immensely strong, and adapted for either hand, horse, or steam power. This machine is fitted with two sets of rollers, both of which are adjusted by a double eccentric movement. It will reduce the hardest and largest cakes into seven sizes, varying from the largest size required for bullocks, down to dust for drilling. Price, including dust-screen and wood box, £6 10*s.*; pulley for power, 12*s.* 6*d.* extra.

Other oil-cake breakers have obtained considerable celebrity; and among these are those manufactured by Messrs. Ransome and Sons, of Ipswich, Suffolk. They have one both powerful and effective. It is fitted with a pair of toothed rollers, for breaking the hardest cake; and, by means of a parallel adjustment, the distance between the rollers may be varied so as to reduce coarse or fine at pleasure. It is fitted with another roller and face-plate, through which the broken cake may be made

to pass when required to be reduced to powder for manure. The price of this machine is £12 5*s.* 6*d.*—Another, by the same makers, and called a Combined Mill and Oil-cake Breaker, consists of a bean-cutter, an oat-mill, and an oil-cake breaker; all combined on a neat iron stand. This is a cheap, durable, and efficient mill, for cutting oats and beans, and breaking oil-cake for beasts and sheep. Its price is £9 9*s.*; pulley for steam-power, extra.

CARTS AND WAGGONS.

Carts and waggons of every description, and for every conceivable purpose to facilitate farming operations, have been invented and improved. The Newcastle prize or model one-horse cart, invented by W. Crosskill, has had awarded, by the Royal Agricultural Society of England, the Silver Medal, at Lincoln, and the first prize of £5, at Newcastle. It is plain and durable; useful for general purposes; and, we are informed, that upwards of 6,500 have been sold. It has loose side and end-boards; a simple tipper for delivering manure, &c., in heaps, and patent wheels. Its price is £14 5*s.*; or, with harvest shelving, £15 15*s.*—A light spring cart, by the same maker, has had awarded to it the prize of £2 for a cheap market cart, by the Royal Agricultural Society of England, at Leeds; also, the first prize by the Highland and Agricultural Society of Scotland. It has patent wheels, 4 ft. 6 in. high, 1¾ in. convex tire, to carry 15 cwt., and is well adapted for a nag-horse to convey luggage, &c. Price, £12 15*s.*—A harvest cart, invented by J. Hannam, Esq., of Burcott Park, is a very good one. It possesses a light and low body (expressly adapted for carrying hay, corn, &c.), and patent wheels, 4 ft. 6 in. high, with convex tire—which does not injure grass land like the flat tire with sharp edges—4 in. wide. Its price is £14, or, with front and hind ladders or raves, £15 10*s.* This, also, has had a prize awarded it. An improved one-horse cart, with harvest frame, is a capital implement for farm work; and there is a very good one, made by Woods and Cocksedge, Stowmarket, Suffolk. It has been awarded a first prize by the Royal Agricultural Society of England; and is made of the best seasoned timber; fitted with an improved self-acting tipping apparatus, with side boards, scrap-iron arms, fagoted, steeled, and turned up, boxed and capped, with the improved fall linch-pin, rendering accident impossible; 14-spoke patent boxed iron nave wheels; nave of the best seasoned English timber; tire of wheels, 4 in. wide, and ⅝ in. thick. Price, complete, £15 10*s*; without the harvest frame, £13 10*s.*—Mr. Thompson, of Lewes, Sussex, sells a combined one-horse cart, water-cart, and irrigator; invented, improved, and manufactured by him. This implement obtained the first prize—a gold medal—and 250 francs in Paris, in 1856, and is a complete one-horse cart, which, by a very simple and effective contrivance, can instantly be converted into a water-cart, and with an irrigating apparatus for water or liquid manure; its slight additional cost, beyond that of an ordinary cart, has commanded an extensive sale. Price, £18.—The improved harvest cart, by Messrs. Hayes and Sons, Stamford, Lincolnshire, has a great advantage over all other carts, being low to the ground, very roomy, mounted upon wheels with 3½-inch hoop tires, and Scotch iron axle-tree, so arranged that the wheels and axle can be removed in a few minutes, when not required for harvest, and put under a manure Scotch cart body, as preceding ones. Its price is £13 15*s.*—A pair-horse waggon, invented by W. Crosskill, has had awarded, by the Royal Agricultural Society of England, the first prize of £10 at Norwich, £10 at Exeter, £5 at Lewes, £10 at Gloucester, and £3 at Leeds. This implement has patent wheels, 3 ft. 4 in. and 4 ft. 9 in. high, 2½ by in. tire; is light, will carry 3 tons, and turn in a short space. Price, with pole or single shafts, £29 10*s.*, and with double break, £32 10*s.*; harvest ladders, £1 10*s.* extra.—The Yorkshire waggon has had awarded the first prize of £7 by the Royal Agricultural Society of England. It is constructed with oak soles, and stout red deal or plank sides. Has patent wheels, 3 ft. 9 in. and 4 ft. 9 in. high, 3 by ¾ in. tire, to carry 3 tons. Price, with pole or single shafts, £30 10*s.*; and with deep side and end-boards, to put on for carrying bones, soot, &c., £32 10*s.*; drag-chain and shoe, £1 extra.—A light waggon, improved by Crosskill, has its framework of the body constructed of oak, and lined with red deal. It has patent wheels, 3 ft. and 4 ft. high, 2½ by ½ in. tire,

will carry 30 cwt., and turn in a short space. This is a neat and useful vehicle, suitable for one horse, or a pair of ponies. Price, £21 with single shafts.

A two or three-horse waggon, invented and manufactured by Messrs. Hayes, is excellent for quick delivery of corn, flour, or any other produce. It is mounted upon springs and patent axles, of the best manufacture, and will carry 60 cwt. It is fitted with pole, or two pairs of shafts, so arranged that either pair will work with a single horse. It has a seat in front, whereby the horses can be driven at a fast rate. The body is so constructed, with a circular front, made of iron, that it will turn in twenty feet of ground; the front wheels, 4 ft. 4 in. high; and body no higher from the ground than ordinary waggons without springs: a great advantage in loading and unloading, and easy draught. This waggon has obtained several first-class prizes. Price, £12 10*s*.—The same makers produce a light one-horse spring waggon or van, mounted upon patented axles, and fitted with four side and three cross springs, of the best manufacture. The front wheels lock under; body wide and square, up-fitted with floating raves, and strengthened with angle iron plates, for top loading. The framing of the body is made of the best English oak. In every respect, it is complete for railway carriers, merchants, and manufacturers; and very suitable for town or country.—Its price is £35. It would be almost endless to describe all the excellent carts and waggons in use. They are, as we have said before, of every kind; and almost every maker has his patented article.

CHAFF-CUTTERS.

Chaff-cutters are, like carts, very numerous, many of them exhibiting very slight differences in their construction. One is especially arranged for small occupations, fitted with toothed rollers, and having all the working parts securely protected. Its price is £2 10*s*.—Another is constructed entirely of iron, having the improved form of toothed rollers, rising mouth, and adjustments similar to the larger machines. Its price is £3 15*s*.—Another is constructed to work by a simple arrangement of wheels, instead of worm; fitted with an improved form of toothed roller, rising mouth, patent steel mouth-piece, and arranged to vary the length of cut without change wheels. This is well adapted for export, packing in a small compass. Price, £5 10*s*.—Another has a stop-motion, and a patent steel mouth-piece, which is never worn hollow or uneven by the friction of the passing knives. Price, £7.—Another, of greater power and capacity, is adapted for steam or horse-power; fitted with the patent steel mouth and other improvements, the rising mouth adjusting itself to all and every variation or irregularity in feeding. Price, £10.—Another is constructed on entirely new principles, having two pairs of feed-rollers acting independently of each other, with the steel mouth-piece and stop motion. The accuracy of the fitting, and the solidity of construction, recommend this implement for steam-power.—Besides these, Mr. Samuelson, of Banbury, has invented a chaff-cutter on an iron frame, and adapted for hand or machine power. The feed-rollers are self-adjusting, to suit the thickness of straw or hay, so as to keep it at a uniform pressure. It is fitted with stop motion, enabling the man feeding to throw it out of gear without stopping the driving power. It has two knives, and the size of mouth is 11 in. by 3½ in.; intended to cut ¼-inch chaff, but wheels for other lengths are supplied at 5*s*. per length extra. Price (carriage-paid to any principal railway station in England, Scotland, and to Dublin, Cork, or Waterford), with pulley, £10 15*s*.; without pulley, £10.—Messrs. Ransome, of Ipswich, produce chaff-cutters adapted for large occupations, railway carriers, job-masters, &c. These may be used by steam or water-power; cuts $\frac{3}{16}$th, ½, and ¾-inch lengths, and more, if so ordered. They are fitted with rising and falling rollers, adapting themselves to the thickness of the feed; have three knives, and will cut from 30 to 35 cwt. of ½-inch chaff per hour. The cog-wheels are all covered over, and fitted with striking-out gear. The box can be removed when not at work. Price, £24; pulleys for steam-power, extra.—Another, by the same makers, can be worked by one or two men, horse or steam-power. It cuts different lengths of chaff; viz., ¼ and ½ inch, or a greater variety, if ordered. It has rising rollers and patent striking-out gear, and is well adapted for general use. Can be fitted with two or

three knives, as ordered. Price: for one man, £10 10*s.*; for two men, £11; for horse-power only, £10 10*s.*; steam-power only, £11 11*s.* —The prize chaff-cutting engine, for steam-power, was invented by the late Hugh Carson, of Warminster, and improved and manufactured by the Messrs. Ransome. It was awarded the only prize at the Canterbury meeting of the Royal Agricultural Society, and at the Cardiff meeting of the Bath and West of England Society. The mouth of this machine is 10½ inches wide, and it will rise to 5 inches deep. It has two pairs of feed-rollers, rising mouth, and roller, and will cut three lengths of chaff. The feed can be stopped or reversed instantly at the will of the feeder, or in case of accident. It has three convex knives; and its price is £13 13*s.*; pulley for power and change-wheels extra.

CHURNS.

Although these implements can hardly be said to belong to the machinery of the farm, properly speaking, still they are very necessary in the manipulations carried on in one department of it. Accordingly we will describe a few of them that have obtained some degree of celebrity. The improved barrel-churn consists of a sort of barrel, made of the best oak wood, hung on a frame, so as to revolve without much friction; the cream is put inside, and the whole turned round by means of the handles; in this manner the cream is thoroughly shaken, with the least possible expenditure of power. It is adapted for from 2 to 40 lbs. of butter. Price, £4.—The patent Sussex churn, invented by Green and Hale, of Brighton, improved by R. Green, of London, and manufactured by Perkins and Son, of London, is made of block tin, with trough for placing hot or cold water, to obtain, at any season of the year, the proper temperature: to make 7 lbs. of butter. Price £1 5*s.*— The patent American churn, invented by C. I. Anthony, of America, has received prizes at all the meetings of the Royal Agricultural Society since its introduction, including that given at the Great Exhibition of 1851. It is simple in construction, easily cleaned, and the operation of making butter is usually performed in ten minutes. The principle is, that by means of cells in the dasher, the air is forced through the cream, thereby causing a greater separation of particles to take place, and also a larger quantity of butter to be made. The price, to make 3 lbs. of butter, is £1 10*s.*

CLOD-CRUSHERS.

The clod-crusher, invented by William Crosskill, of Beverley, is an improvement upon the well-known roller to which the gold medal of the Society was awarded, in 1846; and it received the first prize at the competitive trial of clod-crushers at Warwick. The roller-discs are made of different diameters, in order that they may be cleaned by the irregular motion produced; and they are kept in an upright position by a novel arrangement of the bosses or centres. The 6 ft. size is most generally used. Its price is £16 10*s.*; travelling-wheels, £2 extra.—There is a cast-iron press-wheel clod-crusher or land-roller, invented, improved, and manufactured by Messrs. Amies and Benford, Peterborough, Northamptonshire, with cylinders or rings 30 inches diameter, on Cambridge's principle; but the frame is made wholly of wrought iron, and has a steerage wheel and guide-rod, instead of the ordinary wood shafts. By this arrangement the undue strain upon the shaft horse is avoided, and a saving of at least one-third in power is effected; the greatest possible strength is also secured. It is provided with a seat for the driver, which enables him to dispense with the services of a boy, as, with the assistance of reins, he has perfect control over both horses and implement. The price, fitted with patent scrapers, is £19.—Messrs. Wedlake and Dendy, Hornchurch, Essex, have registered an economic clod-crusher and pulveriser. The great defect of all rollers and revolving clod-crushers is, that when the soil is partially pulverised, they have a tendency, instead of crushing the remaining clods, to press them into the loose soil beneath, so that the process of harrowing and rolling must frequently be repeated, and the land thus often rendered hard and solid, without effecting the desired pulverisation. This defect is said to be both easily and quickly remedied by the economic pulveriser, which rubs the clods into a fine mould, at the same time levelling the surface of the land, and leaving it light, friable, and in a greatly improved condition. Price £5 15*s.*

CORN-SCREENS.

The corn-screen, or smut machine, has a diameter of 14 inches, and consists of iron conical-fluted scrubbers, interspersed with covered fans at suitable distances. Immediately the grain leaves the machine an exhaust-blast is applied, which draws chaff and light seed up from the good grain. Price, £30.—Another implement of this kind, invented, improved, and manufactured by William Ball, of Bothwell, had awarded a silver medal by the Royal Agricultural Society of England, at Chelmsford, and the first prize at the trial of corn-screens by the Royal Agricultural Society, at Chester. This machine effectually separates all the thin kernel from either wheat, barley, or sainfoin, and gives an equal and weighty sample by means of a patent screen that clears itself at every oscillation. It will screen about sixty bushels per hour. Price, £7.

A new implement of this description, invented by Mr. Boly, of Bury St. Edmund's, has two screens, worked from one spindle. The advantage of this is, that the same lad employed to turn a No. 1 screen, can work this, as it requires no more power, one screen acting as a counterbalance to the other; and, compared with a No. 1 screen, just double the work can be done. It will screen, in fact, 180 bushels per hour. Price, £16.

CHEESE-PRESSES.

A single cheese-press, with wooden stool and double lever and pulley, invented by the late Hugh Carson, of Warminster, has been, and is now, improved and manufactured by Messrs. Wedlake and Dendy. It has a compound lever, and a pulley at the end of the second lever, over which a chain passes, secured at one end to the press, and, at the other, the weights are suspended; the effective weight is thereby doubled, and great pressure obtained for large cheeses. There are four weights, which can be used as occasion requires, depending on the state of the cheeses. The price of this implement is £2 15*s*.—Another, by the same makers, has received prizes from the Royal Agricultural Society of England, at Chester, and a silver medal at Salisbury; from the Bath and West of England Society, at Newton Abbott; and at Cardiff. It is similar in principle to the other, but has an iron stool, eighteen inches in diameter, with a channel for carrying off the whey which runs from the cheeses. Price, £3.—A cheaper press is made by Messrs. Wightman and Dening, Chard, Somerset. It has been improved by a roller being placed on each side of the follower, to facilitate its working against the uprights, or guides, thereby preventing friction. It occupies but small space, and the pressure can be regulated from 1 to 16 cwt., by means of a weight shifting on a lever. Its price is £2 10*s*.

CORN-DRYING MACHINE.

A patent corn-drying apparatus, invented and improved by Don and Co., of London, and manufactured by Smith and Co., of Leeds, is, perhaps, rather expensive for most farms. It is made for drying all kinds of grain, seeds, or berries; is heated by steam, and fitted with apparatus to exhaust the steam as it is given off from the grain. It is well adapted for the drying of Egyptian and Black Sea wheat, or other grain which has been washed, for the purpose of freeing it from clods of earth or other impurities, and for mollifying the grain which has been injured by salt water, or found too dry for grinding purposes. Complete, and fixed in London, its price is £150.

CULTIVATORS.

Messrs. Robinson and Son, of Burton-upon-Humber, Lincolnshire, have invented a drag-harrow, or cultivator, suitable for working fallows. It is made almost exclusively of wrought iron; the teeth can be moved either horizontally or vertically, so as to suit the number of teeth to the state of the land. The principal improvement consists in one lever in the middle, raising and lowering the whole of the harrow, without the aid of side levers, as in other cultivators. They are made of various widths, to suit different occupations; and the price is £10 10*s*.

A chain harrow, invented by Cartwright, of Shrewsbury, consists in the absence of any rigid links in the body of the harrow, which, in some states of the soil, have a tendency to clog; the links are expanded by improved bars, which only touch the extremities of the harrow, leaving all the links free. The size 9 feet wide by

7 feet 6 inches, and very strong, is charged £6 15*s*. Messrs. Smith and Taylor, of Ipswich, have a patent cultivator, or broadshare, adapted for all the purposes of a broadshare, scarifier, or drag-harrow, fitted with five wrought iron tines, arranged so that either shares or points may be used, which can be raised out of the ground backwards. It is similar to a drag-rake, and is self-relieving, when choked with weeds, stubble, &c., or when turning at the ends of the land. Fitted with side levers, to regulate the depth of work, it is charged £9 10*s*.

Mr. Charles Clay's cultivator and eradicator is a very good implement, applicable to all cultivating purposes, such as broadsharing, cultivating, and grubbing. The tines are fixed to revolving bars by keys, in a very simple manner, and are raised out of the soil backwards, similar to a horse-rake. Prizes have been awarded by the Royal Society, at Warwick, and by the Council of the Paris Exhibition, as well as by numerous local societies, to this cultivator, and it is now well known as a first-class implement. It is worked by two horses, with five tines. Price, £7.—This maker has also a new implement adapted to steam-power. It runs on one pair of wheels, five feet in diameter; requires one-half the usual power, and does not require to be turned at the ends. The tines are mounted upon revolving bars or axles; and, by reversing the engine, the tines place themselves in and out of work without any attention from the man, who sits at one end of the implement, and steers by a lever attached to the large pair of wheels, which are in the middle of the frame. Its price is £10.

DIBBLING MACHINE.

A new patent grain and seed-dibbling or planting machine, with six planting wheels, invented and manufactured by Mr. Freer, of Rothly, Leicestershire, is an expensive implement, but of excellent construction. It deposits its seeds by hollow iron wheels, which, when drawn over the ploughed soil, press holes, concentrating the ploughed soil, and reuniting it with the subsoil, by which means the roots of the plants are conducted deep into the earth. Another advantage of concentrating the soil beneath the roots is, that the surrounding loose soil, as it falls by the weather, breaks from the stems, allowing them to expand, and making the crop less liable to be brought down by storms. The machine is capable of depositing from one peck to four bushels per acre; but not more than half the seed used by the drill is required to produce an average of five bushels per acre more than with the drill. It is also durable, and warranted to work efficiently. Its price is £60.

DRESSING MACHINES.

Of these machines there are several good makers, each of whom has his own improvement to recommend. Mr. Crosskill's has five riddles, and two screens for wheat, beans, &c., and can be used as a blower by removing the riddles. It is very simple and effective, and an immense number are now in use. Price, £8 10*s*. Messrs. Holmes and Sons have manufactured 3,000 of these machines, which are very efficient and simple. They turn easy for the man; will dress a large quantity, making a good sample; are very strong, and fitted up with great care. Price, £9 9*s*.; carriage wheels, 7*s*. 6*d*. extra.—The same makers have another, which is very useful for small occupations, and is much approved. It is made on the same principle as the preceding, but smaller, with riddles of 18 by 16; and the price makes it a favourite in small occupations. It is £5 10*s*.—A 20-in. riddle corn-dressing machine, for all kinds of grain, is made by Messrs. Stacey and Sons. With improved wind-board it is convertible, with ease, into a powerful blower or rectifier; being simple, and its performance equal to the more complicated arrangements. Fitted with six corn-sieves, its price is £10 10*s*.—Another, to which upwards of forty prizes have been awarded during the last twelve years, including the first prize at the Highland and Agricultural Society's shows, held at Glasgow, Edinburgh, and Dumfries; and first and second prizes at Perth. These machines effectually separate the grain from all impurities; are easily driven, and deliver the grain at the side. They are made by Richardson, of Carlisle, in Cumberland. Price, £9 10*s*.—Another, for hulling clover and trefoil seed, and made by the Rev. R. Hunt, of Earl's Colne, Essex, received the prize at the Bath and West of England show, and the silver medal at Carlisle.

It is for separating the husk or hull from the seed, which it does in a most expeditious manner, and without injury to it; a dressing apparatus is attached for separating chaff, seed, and hard cob, mounted on four wheels for travelling. Its price is £46.

DRILLS.

These implements are made by numerous manufacturers, but are all very similar in their construction. What is called the Improved Suffolk Lever Corn Drill, made by Messrs. Garrett and Son, obtained the prize of £10 at Norwich. It is adapted for drilling in rows, at any distance apart, wheat, barley, beans, peas, and other grain; also turnips, mangel-wurzel, and other seeds, on every description of land, and will deposit quite evenly on steep or side hills. The price of the 13-row drill, with good levers, is £26 15*s*.—Messrs. Holmes and Son have a seed and manure drill, on the flat ridge. This machine received the highest prize of the Royal Society of Leeds, and has rollers working between the manure and seeds, which effectually cover the manure, and leave the ridges in their proper form. The seed is also covered up by a light roller following, when worked as a ridge drill. Price, £25. —Messrs. Tasker and Sons have invented a broad-cast corn-sowing machine, which delivers the corn by cups from the box on to a wire screen, which distributes it regularly; the quantity is regulated by different-sized cog-wheels. Three screens are sent with each machine, to be used according to the description of corn to be sown. One horse can draw it, and twenty acres a-day can be gone over. Price, £16 10*s*.—They have also invented a corn drill for eleven rows. This implement will drill every description of grain in rows at any distance apart, from six inches and upwards, and is seventy inches wide between the carriage-wheels. The quantities sown are regulated by different-sized cog-wheels, and the supply of corn from the box to the barrel by movable slides. The price, fitted with improved steerage, is £27 10*s*.; without steerage, £23.—Another machine of theirs, the nine-row corn and seed drill, is suitable for small occupations. It will drive all kinds of grain and turnip seed, the quantities being varied by different-sized cog-wheels. The distance between the rows may be increased to suit the various crops. The whole of the different parts are arranged as simply as possible. Price, £21; mangel-barrel, £1 10*s*. extra.—They have, besides, a drill for sowing turnips and mangel-wurzel seed with manure. The quantity of manure drilled can be regulated by a slide moved by racks and pinions, and can be adjusted, at pleasure, by the man in attendance. It is 84 inches between the carriage-wheels. Price, £24 10*s*.; steerage, £4 10*s*. extra.

ELEVATORS.

A portable straw elevator was invented by James Hayes, of Elton, and improved and manufactured by Messrs. Clayton and Shuttleworth. It is adapted for taking the straw from the end of shakers, when worked in conjunction with a portable thrashing machine, to the height of 20 feet, or more; absorbs very little power; will deliver the straw, in any direction, from a straight line to right angles, and is calculated to save the labour of three men. The price is £59.—The same firm has another implement, invented by S. W. Campain, of Deeping St. Nicholas, and improved by them. It is adapted for conveying the straw, by means of an endless wire rope, to any distance, height, or angle. The apparatus is simple, and not liable to get out of order. Price, complete, including carriage for travelling, £45.—Another implement, of a similar description, was invented by James Hayes, of Elton. It is worked in conjunction with the portable thrashing machine, and will deliver the straw 20 feet from the machine, on to a stack at any angle, which saves, also, the labour of three men. Price, £59.

FARM RAILWAYS.

Specimens of improved portable farm railways, invented by William Crosskill, have appeared at various exhibitions. The rails are constructed to carry loads of 15 cwt., and are made of wood edged with iron where the wheels run, and framed together in lengths of 15 feet. These lengths are connected by an improved fastening-piece, easily adjusted, and not liable to get out of order. Price, 4*s*. per running yard. There is an additional charge for points, switches, &c. Trucks are con-

structed to run on this portable railway—one to tip the load on either side, and one to tip endwise. Price, £5 10*s.* each.—An improved turn-table for portable railways, also invented by William Crosskill, is constructed to fit the portable railway, 2 ft. 6 in. gauge, and is found to be an important addition to it when required to turn the trucks at right angles, or round sharp corners, and especially when the railway is fixed in cattle-sheds, for carrying turnips, &c. Price, £5 10*s.* These inventions have not yet been brought into very great use.

GRUBBERS AND SCARIFIERS.

If the utility of any implement is the measure of its worth, there can be no question of the value of the various classes that come under the different denominations of grubbers and scarifiers; the great object gained by their use being a very considerable saving in the number of ploughings required for any course of farming, as much even as to the extent of half of the number, according to the calculations made by some. They are also of use in stirring the soil in the intervals of the drills. Carson's seven-share scarifier is a very excellent implement of its kind, covering a large space in its operations, and with the shares made broad.—Coleman's scarifier, with five or nine tines, is a well-known implement. A prize medal was awarded for it at the Exhibition of 1851; and, in the report of the jury, the advantage in saving of labour is thus pointed out:—"Coleman's scarifier, one of the best for hard ground, is five feet wide, seven times as wide as a plough, and drawn by six horses. These three pair, therefore, will cover as much ground as seven pair at plough; and the labour, accordingly, would not be half of one ploughing." It is also stated of this, that it "never rises or swerves, but does its work as true as a plough—doing it, therefore, once for all. This is a decided advance, and greatly facilitates the substitution of the scarifier for the plough." A prize was also given for this at the meeting at Carlisle; and it is ranked as the first of the class, together with Garrett's and Bentall's, of which "the superiority was not contested" at the Paris Exhibition of 1855. —The Messrs. Howard's scarifier is of wrought iron, so made as to combine strength with lightness. The coulters are formed so as not to cut or break the "couch," but draw it from the soil, and deliver it on the surface. The price, with five coulters, is £5, increasing £1 for every additional two coulters, up to eleven, for which the price is £8.

Grubbers, scarifiers, scufflers, &c., perform a very important function in agriculture, diminishing the amount of labour, and reducing the expense of tillage. It has been calculated that, by the use of these machines, the number of ploughings is brought down to one-half, and the work more effectually done. Messrs. Bentall have long been known for their broad-share: it has three or more points, the centre one projecting, and may be used as a broad-share with several tines, to a breadth of 6 ft. 6 in., or, with the centre point alone, as a subsoil plough. This implement is especially adapted for heavy soil. Messrs. Bentall have also cultivators for light land.—Messrs. Clay's implement, of this class, is strong, the tines being raised backward, as in a horse-rake, and the width of the cup can be varied during the working.—Tennant's self-cleaning grubber cleans and pulverises the soil, and is made so as to take to pieces easily, and be packed into a small compass.

HARROWS.

Amongst the makers of harrows, Messrs. Howard, of Bedford, take a high place. Their set of patent four-beam iron harrows are recommended as useful three-horse harrows, having a width of 10 feet. Price, £4. Their patent jointed iron harrows are of similar construction to these, but with six rows of teeth, and furnished with joints in the centre of each harrow, which allow them to adapt themselves to the form of the ridges, or any unevenness of the surface. By a simple arrangement these joints may be easily locked, or allowed as much play as required: this is a valuable improvement. It is found desirable, in very rough work, to fasten the joints. Width, 9½ ft. Price, £4 6*s.* Their patent jointed iron harrows gained the first prize, as the best light harrows, at the Gloucester, Lewes, Chelmsford, and Warwick meetings of the Royal Agricultural Society of England. The teeth are arranged so as to leave a fine surface, and they are adapted for a pair of horses. Width, 8½ ft. Price, £3 12*s.* Their patent two-beam

iron harrows are adapted for land ploughed in small stitches of eight, ten, or twelve furrows. These harrows having but two beams, they adapt themselves to the shape of the ridge, and fall into the furrows better than wider harrows. The couplings are made with an improved joint, which preserves the relative distance of the harrows. Width, 9 ft. Price, £4 8*s*.—Mr. Cambridge, of Bristol, has a patent-jointed self-expanding chain harrow, invented and improved by him. This harrow is so made as to yield to the land, however uneven it may be. The links are made to work between each other, producing double effect. It is fitted with a tubular iron whippletree, which is not so heavy as wood; yet stronger, and more durable. The links are made of round iron, which work cleaner and lighter in draught, but producing more effect. It is so constructed, that two most perfect harrows are combined in one, as the front part can easily be removed, and the two other parts attached to the whippletree. It is 8 ft. 6 in. wide, and 7 ft. 6 in. long. Its price is £6. He has also a set of three four-beam patent tine harrows, invented and improved by himself. They are made with thin cutting tines, which are more effectual than any other. The beams are of double-flanged or ribbed iron, put on edge, which makes the strongest beam that can be used for harrows. The tines are fitted in the flanges of the beams, and secured by bolts and pins, and there is no possibility of their getting loose. Each tooth cuts a separate track, at equal distances. The price of the set is £4 10*s*. A set of light patent solid frame harrows, with adjustable teeth, have been invented and improved by Messrs. Ransome and Sons. They are of entirely novel, yet simple construction. The teeth are of equal size throughout, not being shanked as usually is the case, and therefore very strong. They can be shifted when the points are worn, so as to make the teeth as long as when new. Any tooth can be taken out in an instant, and replaced with the least trouble. The framework is quite independent of the teeth, and is not taken to pieces when packed. It covers nine feet, and the price is £5.—A set of patent double-action steam harrows are invented and manufactured by the Messrs. Howard. They are made to work either backwards or forwards, like the steam cultivator, the attendant steering them in the same manner. They are most useful implements after the land has been broken up by the steam cultivator; and fifteen to twenty acres a day may be done with them much more effectually than by horse-power. Price, £12.—The improved Norwegian harrow, by the same makers, is adapted for steam-power, and worked backwards and forwards in the same manner as the last implement. Price, £18.

HAY MACHINES.

A great saving of labour results from the use of these machines, and the work is more quickly done; the great point to be attained in the construction being, that the work shall be done without clogging. All the working parts of the machine must, therefore, be so arranged as to prevent any grass or dirt from interfering with the mechanism. The patent haymaking machine, invented and manufactured by Messrs. Howard, was first exhibited at the Leeds meeting of the Royal Agricultural Society of England, in 1861, when it gained the first prize. The fork barrels are so arranged as to render clogging almost impossible. The forks themselves are mounted on short heads, in sets of three, and placed in zigzag position, which more perfectly separates and distributes the crop. The gear-work is strong and simple; the sliding pinions used in other double-action machines for reversing the motion being dispensed with. A simple eccentric moves the pinions in and out of gear instantly. A similar movement is also used for raising and lowering the barrels. Its price is £15; if fitted with patent roller—to prevent the grass lodging on the front—15*s*. extra. Their patent haymaking machine is similar to the preceding, but with double shafts, for two horses abreast. Price, £17; if fitted with patent roller—to prevent the grass lodging in the front—15*s*. extra.—Messrs. Ashley and Co., of Stamford, have a patent haymaking machine, to which, for ten years in succession, all the prizes of the Royal Societies of England, Scotland, and Ireland, were awarded, as well as the prizes of all the principal provincial societies: also seventeen additional prizes since the expiration of the ten years; seven

prizes having been taken in 1861, including the first prize of one hundred guilders, at the great trial of haymakers, at Haerlem, in Holland. The first prize gold medal and 200 francs were also awarded to it at the great meeting in Paris, 1860. It still continues to maintain its well-earned reputation; 800 having been sent out during the last two years without a single failure. The price of this excellent machine is £15 15*s.*; if with wire guard, to keep the hay off the horse in windy weather, 15*s.* extra.—The same makers have another similar machine; but it has attached to it double-edged steel blades, for cutting down young thistles.—They have also patented a method of attaching forks to the same for breaking and distributing manure on grass land. Price, £15 15*s.*; if with eight thistle knives, 32*s.* extra; forks, 40*s.* extra; forks and knives, £3 3*s.* the set complete.—Another, in many respects similar to the preceding, but simplified in its construction, with external instead of internal shifting gear, and the fork bearers revolving on a solid main axle, is made by them. It is remarkably easy to take apart for cleaning or repairs, by an ordinary smith; and the apparatus for reversing the action and throwing out of gear is operated upon by means of a lever at the near side, so that the man has entire control of his machine without leaving his horse. He can also raise or lower the machine while going along by the side of his horse. Price, extra strong, £16 16*s.*

HORSE-HOES.

In the manufacture of hoes, Messrs. Garrett and Sons have been very successful. Their patent lever horse-hoe has successfully carried off fourteen prizes—£65 in specie—and five medals. It will hoe effectually all drilled crops of grain or roots, and on every description of soil. A man and a boy will do from ten to fifteen acres per day, at a cost of 6*d.* per acre. Fitted with the new patented arrangement for regulating the position of the hoe blades, its price is £19. Messrs. Carson and Toone have a wrought iron horse-hoe, for hill sides, with hoes, and five tines; invented by the late Hugh Carson, of Warminster. It received a prize from the Bath and West of England Society at Cardiff, and was highly commended by the Royal Improvement Society of Ireland, at Londonderry. It has a new steerage apparatus, under the immediate control of the man attending it, which turns the wheel, and, at the same time, alters the line of draught in the contrary direction. It thus secures straight work on the hill side. Price, £4.—Messrs. Priest and Woolnough have a patent horse-hoe for roots, invented by themselves. It was awarded a prize at the meeting of the Royal Agricultural Society of England, at Salisbury, and first prize at that society's meeting at Leeds. It is adapted for hoeing between the rows of all drilled crops. The hoe is made the same width as the drills it is to follow, and hoes at once as many rows as were drilled. Each hoe works on a separate lever, which is pressed into the ground by weight like a drill, so that all the ground between the plants is cut, however uneven it may be. The exhibitor's patent improvements are indispensable to the effective working of the implements. Price, £19.—They have another machine for corn and roots, to which was awarded a prize by the Royal Agricultural Society of England, at Salisbury, and first prize at Leeds. It is of similar construction to the preceding, but set for hoeing wheat. The patent improvements allow the attendant to adapt the hoe to lands or ridges, or side hills, as well as to regulate the depth of the hoeing while it is in motion. Price, £22.—Another implement for small occupations, for turnips, &c., is similar in principle to the preceding, but reduced in size, and number of levers and hoes, to adapt it to farms of moderate extent. It is fitted with an arrangement whereby the man steering, by depressing the steerage handles, takes the hoes out of work. Price, £12 12*s.*—Another, for small occupations and general purposes, is also similar in principle to the preceding, but fitted with sufficient levers and hoes for two hoes to work between the different rows of plants. These horse-hoes are well adapted to follow small occupation drills. Price, £14 14*s.*

A patent turnip-thinner and horse-hoe combined, invented, improved, and manufactured by John Eaton, had a prize of £5 awarded to it at Leeds. It is especially adapted to thin or bunch-out turnips or wurzels, on the ridge or flat, preparatory to singling by hand; leaving the bunches at nine, twelve, or fifteen

inches apart, and hoeing all the ground between the rows at the same operation.—Another, of a similar description, is made by the same manufacturer. A man and cob horse, with these implements, will bunch-out and hoe from three to four acres per day, requiring only children, or inexperienced persons, to follow after the cut plants are withered, leaving the best and single plant—thus expeditiously often saving the whole crop.—Another implement enables the operator to miss the plants in thin places, by simply raising the handles, and thus avoid cutting-up one plant that ought to be left growing, the flat hoes remaining in work as before. These implements can be used as ordinary horse-hoes, by simply taking off the revolving frame.—Another implement can regulate the size of the bunches left, according to the state of the soil or superabundance of the plants growing, by putting on longer or shorter revolving hoes. Extra hoes for the purpose at 5*s*. per set. The price of each of these machines is £6 6*s*.

HORSE-RAKES.

These implements very materially diminish the labour, and, in consequence, are very extensively adopted. In most of them, the tines are made to act separately, so as to yield to any inequality of surface. The leverage has been lately much improved, the action being very light. The Messrs. Howard have patented a horse-rake, which has carried all the first prizes, for some years past, awarded by the Royal Agricultural Society of England for this implement. It is used for collecting hay, corn, stubbles, twitch grass, and leaves; for dragging meadows after a flood, raking in clover and grass seeds, and as a weed extirpator on corn crops in the spring. A guide is fixed to all the rakes, to prevent the lever from being strained by careless usage; the end of the guide forms loops, through which a pair of reins can be passed. Extreme width, 7½ feet. Price, £8 5*s*.; if fitted with twenty-eight steel teeth, £8 12*s*. 6*d*.—Another, invented and manufactured by the same makers, gained the first, and only prize, as the best horse-rake at the Leeds meeting of the Royal Agricultural Society of England, in 1861. The teeth of the rakes are formed so as to collect no rubbish with the corn, and, by a new arrangement, are allowed greater freedom to adapt themselves to the irregularities of the surface. The raising bar is placed above the heads of the teeth; so that when the lever is put into action, the raising bar, pressing upon the heads, brings the teeth out of work. Price, £8 15*s*.; if fitted with thirty-two steel teeth, £9 2*s*. 6*d*.—Another, with movable shafts and wheels, is on the same principle as the former, but made so that the shafts can readily be moved to the end of the rake, by which means the implement can be drawn endwise through any gateway, or along very narrow roads. It is well adapted for Wales, and other mountainous districts, where the roads are too narrow for the ordinary horse-rake. Price, £9 10*s*.—Messrs. Smith and Brothers, of Thrapston, Northamptonshire, have a steel-toothed horse-rake, which took a prize at the Royal Society's Show, at Salisbury; also a special prize at the Manchester and Liverpool Agricultural Show, at Wigan. The beams are made of tubular iron; the teeth of spring steel; which makes it light, strong, and durable. It has a lever behind to raise the teeth when the rake is full. It is mounted on wrought iron wheels, which are capped to prevent the hay from winding round the axles. Price, £7 15*s*.—A patent balance horse-rake, invented by C. Woods, of Ipswich, improved and manufactured by Messrs. Ransome and Sons, is made on an entirely new principle. The man rides, and, by his weight, partly counterbalances the teeth; so that the work of discharging the load, which is done by his foot, is greatly lessened. The wheels are of wrought iron, and very high, so that the draught is light. This rake is especially useful when large tracts of land must be covered in a short time, both at home and abroad. It covers 10 ft. in work. Price, £17 10*s*.—The same firm has also invented and improved a lever horse-drag rake. This light and effective implement rakes the land quite clean, and is unloaded without stopping the horse. The form of the teeth is so constructed as to enable them to carry a great load. By means of a sliding-rod, each alternate tooth may be raised out of work—a desirable arrangement for raking twitch, &c. It is fitted with side levers, by which the teeth can be heightened or lowered at plea-

sure; and also with steel teeth. This implement will cover, in work, 6 ft. 6 in. Price, £8 5*s*.

MANURE DISTRIBUTORS.

The introduction of artificial manures has necessitated the construction of implements which shall distribute them equally over the surface. These distributors are well adapted for the purpose. Many of the drills are also arranged so as to deposit these manures in an even manner.

Chambers's patent broadcast manure distributor, invented and improved by Thomas Chambers, jun., and manufactured by Messrs. Garrett and Sons, has taken prizes at Lincoln, Carlisle, Salisbury, and Leeds. It is made with screw regulator and frame shafts; is well adapted for the regular distribution of guano, blood manure, salt, nitrate of soda, &c.; and will sow from two to sixty bushels per acre on flat or ridge. Its price is £19.—Another, on the same principle as the preceding, but of more simple construction, is charged £16 10*s*. —The liquid manure distributor, or water-cart, invented by W. Crosskill, carried the silver medal of the Royal Agricultural Society of England, at Cambridge. The body is made of iron plates, fitted with a brass valve, which a man can open and shut as he walks by the side of the horse. The spread-board is easily adjusted, so as to hang level when on hill sides. It is fitted with patent wheels, 4 ft. 6 in. high, with convex tire, and holds 120 gallons. Price, £17; or, with apparatus for watering four rows of turnips, &c., 15*s*. extra.—A portable pump, for liquid manure or water, by the same inventor, was awarded the first prize by the Highland and Agricultural Society of Scotland, at Edinburgh. It has a 3½-in. working barrel of cast iron, fitted with brass valve and bucket, so that it is not liable to get out of order. Price, with seven feet of leather hose, and three feet of copper tube, £5 15*s*.; portable tripod stand, 15*s*. extra.—Another liquid manure distributor, or water-cart, was awarded the first prize of £6 by the Royal Agricultural Society of England, at Leeds, 1861. It will hold 200 gallons, and is much used for conveying water to cattle, portable steam-engines, &c. Price, £22; or, with apparatus for watering four rows of turnips, &c., 15*s*. extra.—The patent manure distributor of Messrs. Priest and Woolnough, is made for depositing broadcast guano, and other artificial manures, in quantities of from three to forty bushels per acre; and is fitted with a patent manure barrel and steel spring scrapers. The pressure of the spring scrapers on the barrel is so light, that considerable difference is made in the horse's draught; and they may almost instantly be removed when not required. Improved means are adopted to insure a regular delivery of manure; and the distributor is mounted on iron wheels. Price, £19.

MILLS.

The machines which fall under this heading comprehend crushing mills, grinding, crushing and grinding combined, bean, malt and oat mills, flour mills, and bone mills. A few of them will suffice for our purpose. The universal mill, invented, improved, and manufactured by Messrs. Ransome and Sons, consists of a pair of smooth rollers of equal diameter, for crushing oats, malt, barley, linseed, &c.; with a bean mill attached for cutting beans, peas, Indian corn, &c. It will cut and crush every kind of grain or seed on the farm. It is mounted on a strong iron frame, and is constructed with a view to durability and economy of power. Price, £21 10*s*.; pulley, extra.—A steel grinding mill, invented by John Hardley, of Shide, and improved and manufactured by Messrs. Picksley, Sims, and Co., as a general grinder and crusher, has been acknowledged, by competent judges, to be a high-class machine. It combines the properties of a pair of stones and the smooth-roller crushing mill, and its advantages are consequently manifold. It is suitable for grinding all kinds of grain into meal for feeding purposes, at the rate of twelve bushels per hour, or it can be adjusted merely to break the grain. Price, £12 10*s*. —A portable corn mill, invented, improved, and manufactured by Messrs. Ransome and Sons, is mounted on a strong, compact, wooden frame, and is fitted with three-feet best French burr-stones, with a flour-dressing apparatus, for preparing flour for household purposes, which can be thrown out of gear when grinding barley, beans, peas, &c. This machine is adapted to be driven by steam, water, or horse-power; will produce, of barley-meal, six bushels per hour, or of fine

flour, three bushels per hour, with the power of four horses. Price, £70; pulleys, 70*s.* per pair extra.—The same makers have also a portable corn mill. This is a useful mill, mounted on a strong, neat, and compact iron frame, and is fitted with 24-inch best French burr-stones; the lower stone, in this mill, being the runner. The adjustments are easy of access, and it is not liable to get out of order. It can be worked by steam, horse, or water-power. Price, £35.—They have also a portable horse-gear thrashing machine, which is arranged so that it can be put to work without unloading the horse-gear. The power is communicated to the barn-works, through an intermediate motion, by means of a strap. The horse-gear is timed for horses, and calculated on the strength of foreign horses. It may be worked by oxen, if necessary. Price, £85.

MOWING MACHINES.

The mowing is an offshoot of the reaping machine, requiring no delivery; it is more simple in its construction, and has been brought to a great state of perfection, cutting any description of grass crop with ease and certainty. Messrs. Burgess and Key have made great improvements in this machine. Cranton's is made on Wood's principle; it is a smaller implement, and can be worked by one horse. Many of the manufacturers have also combined implements, both for reaping and mowing. This has been done with a view to economy in the purchase-money; but as the principle involved differs in each, the combination can scarcely be expected to produce an implement which can work effectually. Wood's prize grass mowing machine, invented by W. A. Wood, of Hoosick Falls, New York, awarded the highest prize by the Royal Agricultural Society of England, at Leeds, in July, 1861, was highly commended by the Highland and Agricultural Society of Scotland, at Perth; and received a gold medal and 1,000 francs, and the grand gold medal of honour, from the French government, at Vincennes, in June, 1860; also, the highest prizes by the United States' National Agricultural Society; first prizes of the Yorkshire, the Royal North Lancashire, the Royal North Lincolnshire, and the Kent County Agricultural Societies. Of this implement, 800 have been sold in one season. It is said to be unsurpassed in closeness of cut, simplicity of construction, lightness of draught, portability, &c., and will cut one acre per hour, with one man and two horses. It is built in the best workman-like manner, with steel-cutter bars and cutters, connecting-rod, crank-pin, and shafts; the metal used for the wheels and gearing is of a very superior quality, which admits of being made much lighter without reducing its strength, making them more durable, and requiring less power to work them. The cutters are so arranged as to follow the uneven surface of ground when at work, and can, by a lever, be instantly elevated to pass over cut grass and other obstructions by the driver. The knives never work when the machine is backed; they are placed in front, the more easily to be seen by the driver. Price, including two extra knives, six blades, six fingers, bevel pinion, oil cup, &c., £22.—Another machine, constructed on the same principle, is a little cheaper, on account of its not being arranged with shafts for one horse, and a shorter cutter bar, which is 3 ft. 6 in. long. When not in use it will pass through 4-ft. gates. It is light, portable, and of easy draught; simple in construction, and well adapted for the use of small farmers; and will cut from five to six acres per day. Price £20.—Wood's prize combined mowing and reaping machine, is another implement patronised by his late royal highness the Prince Consort, the Emperor of the French, the King of the Belgians, &c., &c., and has been awarded more prizes than any other in the world. Simple in construction, light draught, portable, easily managed, it can be changed from a mower to a reaper, and *vice versâ*, in a few minutes. Of this machine, the large number of 1,200 have been sold in three years. It will cut any kind of grass or grain at the rate of ten to twelve acres per day. Its price, including extra knife, blades, fingers, pinion, and package, is £35. Notwithstanding the great merit of these machines, and the extensive patronage they have received, we have some excellent makers amongst ourselves.

PLOUGHS.

In implements like the plough, the permanent form having been determined by

experience, improvements can only be made in the manufacture of the secondary parts, and in the proper adjustment of the whole. Iron has, in a great measure, superseded wood, the metal combining strength with lightness; the mould-boards are of varying length, to suit different soils, and the coulters can be inclined to one side or the other. The Messrs. Ransome may be said to have originally taken the first steps in improving the plough; and, with Messrs. Busby, Hornsby, and Howard, still sustain the reputation they all have so long merited. The Messrs. Ransome, besides their ordinary ploughs, have introduced a double-furrow plough, for turning two furrows at the same time; by removing the mould-boards of the ridging-plough, it is adapted for a sub-soiler, to work after the plough; and, by attaching a pair of open-ribbed mould-boards, it is adapted for raising potatoes.—Messrs. Howard, in addition to their other ploughs, have a small pony plough.—Messrs. Hornsby, also, besides implements adapted for heavy and light lands, have a pony plough.—Messrs. Hunt and Pickering have invented a new mode of pitching the share: by a simple contrivance, the nose can be altered so as to regulate the depth; and the patent oil-boxes for the wheels, while retaining the oil, exclude the grit.—Messrs. Page have some very excellent forms of ploughs, with an adjusting coulter. In some localities the wooden beam has been retained, and attention has, therefore, been directed to the improvement of the implement under this form of construction.—Messrs. Grey have a sub-soil pulveriser, with improved leverage; and Messrs. Hancock, a triple-trenching plough, which, on any soil, will make a seed-bed at one operation. These are gratifying tests of the ingenuity, and also of application, in reference to the agricultural department of science. It must be remembered that the steam-plough was unknown at the Exhibition of 1851. It might then be considered as in an embryo state, soon, however, to burst forth as an agricultural fact. In general terms, the principle which has now been established would appear to consist of a strong frame, containing either fixed ploughshares or tines for stirring the soil, to which wire ropes are attached; these are received on a revolving drum, worked by a portable steam-engine, the framework being drawn to and fro between anchors fixed at opposite points, until the operation is completed. —Mr. Fowler's name stands among those who have directed attention to the development of steam-ploughing. In that implement the soil is turned over either by shares or by tines fixed in a frame, and having a double set of each, so as to be worked either way. The windlass is attached to the engine itself, or there are revolving drums worked by the engine: to prevent the drag of the slack chain on the land, wire-porters are used—a very important element in saving the wear and tear and the dead weight. The Messrs. Howard make use of revolving drums, worked direct from the engine, by which much power is saved; the wire ropes pass through two revolving wheels lying horizontally, and near the ground. A great improvement has lately been made in the working by the additional central wheel, placed at a little distance from the others, which regulate the action of the wire rope; the rope-porter also is new, and very efficient.—Mr. Stevens's general-purpose implement differs from the others. It is made of wrought-iron and steel, and consists of a main framework, which carries two under-frames. To these are attached eight ploughs, four at each end, which rise and fall parallel to the ground, thus avoiding the balancing or tipping motion. The centre wheels that support the whole machine are strong, and stand 5 ft. 6 in. in height, by which the draught is considerably diminished when in motion.—Mr. Hayes has invented an improved windlass for steam cultivation; the framework is very strong. The following are the peculiarities: —"The plough can be instantly stopped by anchormen at the headland, without stopping the engine, the engine continuing in motion as in thrashing or other work: no signals are required; the work may be performed in foggy weather, or by moonlight, with perfect safety to the machinery. One man can superintend engine and windlass. A double cylinder is not needed, as the engine is not stopped; and no wheels are required to be put in or out of gear."—The machine of Messrs. Samson and Jewell is called a paring and breaking cultivator, and is adapted both for horses and steam-engines. It consists of an iron frame,

upon which are placed four paring ploughs in succession; behind each ploughshare is a rotary digger; as the plough turns the soil, the digger, revolving rapidly, thoroughly pulverises it, and it is at once made into a seed-bed. The machine is worked by a cogged wheel.—Mr. Halkett's is known as the guide-way system of steam-cultivation; in order to adapt it, rails must first be laid down. The machine consists of a large frame running on the rails, and drawn by a steam-engine; to this framework are attached all the implements employed in the cultivation of the soil; and there are arrangements by which labourers can work upon the frame. The system is complete in itself, and, in certain soil and localities, might be made use of to advantage.—These several implements indicate the different plans that have been invented; but they are all worked by portable steam-engines acting upon wire ropes, by means of which the frames themselves are drawn to and fro. Besides the general advantages which must arise from the establishment of steam-ploughing, there is this especial one—that lands, whether heavy or light, can be tilled in unfavourable seasons, when it would be impossible to use horse labour. This principal process of cultivation is thus rendered more certain, and less dependent on the changes and chances of the weather. To descend from generals to particulars, we may instance a two-wheeled general-purpose plough, invented and improved by William Busby, of Newton-le-Willows, and manufactured by the Busby Implement Company. It received the award of the council medal at the Great Exhibition in 1851; a first-class medal at the Paris Exhibition; also six prizes from the Royal Agricultural Society of England in eight years; £10 at the Rotherham meeting, 1856; and a prize at Warwick, 1860. Its price is £4 4*s.*; steel breast clasp chain and weight, 16*s.* extra. Price, £5 complete.—The same company have also a new implement, which is called a combined plough and presser, invented by Thomas Harrison, foreman to the Rev. W. F. Wharton, Banningham Rectory, and J. G. Harrison, Kirby Ravensworth, Yorkshire. It completes the ploughing and pressing the seed-furrow at one operation, saving much labour at seed-time, and requiring little, if any, more horse-power than the ordinary plough. The price of the plough is £3 15*s.*; presser, 40*s.* extra. The pressing plate wheel may be readily attached to any plough. Price, £5 15*s.*, combined.—Messrs. Page and Co. have a double-breast or moulding plough, for earthing-up or forming ridges or bouts for turnips, potatoes, mangold, &c., or for striking water-furrows. The breasts are made of steel, and can be expanded or contracted, as required. The plough is also easily convertible into a horse-hoe, by merely removing the breasts and attaching a set of hoes. The price is 75*s.*; with one wheel, 70*s.*; two wheels, 75*s.*; marker to regulate the width of ridges, 7*s.* 6*d.* extra; and horse-hoes, 10*s.* extra.—Another, similarly constructed, but adapted for the use of a small horse or pony. Price, with one wheel, £2 15*s.*—Another combined moulding plough, horse-hoe, and stirrer. This is, perhaps, one of the most useful, efficient, and economical combined implements ever introduced, it being adapted for three superior implements, and easily and simply arranged for transition into a one-horse hoe, a moulding or bouting plough, and a five-tined expanding scuffler or scarifier. This implement is especially adapted for small occupiers, to whom it is recommended as a valuable appendage. Price, £4 10*s.*; if without bouting-ploughing, £3 10*s.*—The combined plough, drill, and harrow, invented by Levi L. Sovereign, of Canada, manufactured by Clubb and Smith, of 118, Fenchurch-street, London, is another instance of combining several implements in one. The object of this implement is to complete three operations by once going on the land, which economises time and labour, and also prevents horses compressing the soil after the land is ploughed. It is so constructed as to deposit the seed entirely out of the reach of birds. Any width or depth can be drilled. Seed drilled by this implement in Western Canada, produced far superior crops to any wheat otherwise sown. Price, £25.

POTATO-DIGGERS.

A potato-digging plough and cultivator, invented and improved by L. D. Owen, and manufactured by Childs and Owen, of New Oxford-street, London, weighs only 85 lbs.; is light of draught, and simple in its construction.

One man, with a pair of small horses, will easily dig potatoes as fast as twenty persons can pick them up. The potatoes are turned out and distributed on the surface of the ground so clean, that scarcely one bushel in a hundred, whether large or small, is left uncovered. Price, £2 10*s*.—Another, invented by Levi L. Sovereign, and manufactured by Clubb and Smith, Fenchurch-street, London, will, when the tops of the potatoes are gathered, raise the potatoes into baskets. With two horses it will save the labour of ten men. Price, £25.

REAPING MACHINES.

The invention of the reaping-machine is due to the ingenuity of the Americans. It is true that, in the early part of this century, a machine, with a revolving drum, had been used to cut corn in this country; but it did not achieve success; and it was not until Messrs. M'Cormick and Hussey brought their implements over, that any practical solution of the subject took place. These, with the machine of the Rev. Mr. Bell, have been the models on which all improvements have taken place. In the report of the Exhibition of 1851, there were only two reapers mentioned as being present—M'Cormick's and Hussey's; and at a trial made, the council medal was given to M'Cormick, Hussey's on that occasion not working well. At a subsequent trial, however, this implement worked equally with the other, but it was too late to alter the decision. There are two principles on which reapers have been constructed—the one where the implement is drawn forward by the horses; the other, where it is propelled from behind by the horses. The awards of the Royal Agricultural Society seem to have been distributed without any reference to this distinction, so that the principle is still in abeyance.—Messrs. Burgess and Key's implement is an improved M'Cormick, the cutting being done perfectly; the delivery is effected by means of Archimedean screws, by which the cut straw is thrown on one side, ready for the binder. There is a revolving fan, to bring the standing corn more readily upon the cutting-knives. It is thus made entirely self-acting, working with two horses; and, by a simple contrivance, the machine can be shut up so as to pass through any ordinary gate.—Croskill's machine is an improved Bell's. It is *propelled* by three horses abreast, and guided by the driver, who walks behind the horses. The delivery can be made on either side, by means of revolving endless bands. The breadth of cut is 7 feet, so that the work is done expeditiously.—Messrs. Ransome's machine is *drawn* by horses; the delivery is made on the side, by means of a series of rakes and arms revolving round a vertical shaft.—Messrs. Samuelson's implement is a modification of the same plan.—Messrs. Kemp, Murray, and Nicholson's reaper is on Hussey's plan, the delivery being made by a man seated on the machine; thus, with the driver, two persons are employed. The cut corn falls upon a tipping platform, which is delivered on the side by rakes.—Messrs. Dray's is on the same principle.—Messrs. Cuthbert's machine also requires two persons, the delivery being made by a rake over a receiving platform.—Bamlett's is a combined implement, worked with one horse only; the delivery is made by a man on the machine.—Messrs. Picksley and Simms' is made on Bamlett's patent, but with improvements. There is a simple contrivance by means of a lever, by which the cutting-knives can be raised or lowered 6 in. This gives to it the power of a combined machine, and, at the same time, there is the power of accommodating the cutters to any inequality of surface; these two last can be worked by one horse. In 1851, M'Cormick's machine, at the Exhibition, created a greater sensation, in its way, than either Power's statue or Hobbs' locks. Its fame at once, of course, raised up for it a host of antagonists and imitators; and it was not till the golden fruits of many autumns in the fields of England, France, Belgium, and Germany had been saved by this machine, that its superiority was tacitly acknowledged; and even competing agricultural implement-makers were compelled to own that, if not the best, it was certainly the most popular, and the most generally used. The manufacture of the machine, for this country, was, after 1851, entrusted to the agency of Messrs. Burgess and Key; and, since that time, as many as 3,000 have been made, and supplied to the farmers of the United Kingdom, and probably as many more exported to the continent. Since 1851, however, Mr. M'Cormick's patent

for these machines has expired in America, and, of course, the attempt to renew it was violently opposed by all who had, or fancied they had, a better reaper themselves. In the course of the investigation, it came out in evidence that Mr. M'Cormick had sold no less than 40,000 of his reapers in the United States alone; when the patent authorities at Washington, thinking that, out of such a large transaction, the inventor of the machine must himself have reaped a golden harvest of no common weight, declined to renew the patent. Hence Mr. M'Cormick was driven to invent another and a better machine, which has been approved in this country. The old machine, as we may term it now, was one which cut the corn, and, as it dropped back upon the platform behind the cutters, turned it off in "swath"—*i. e.*, left it in a continuous roll alongside the track of the machine. In very moist countries, this swath delivery is rather an evil; and during wet seasons, the machine has been often left unused altogether. In addition to this drawback, a great amount of manual labour is, of course, necessitated to collect the swath into sheaves, and this, too, must in some cases be done before the return of the machine over the same track. The object, therefore, has always been to invent a machine which will deliver, on the ground, the cut corn in sheaves ready for binding; and such a machine Mr. M'Cormick has now invented. It is founded entirely on his old machine, as made by Burgess and Key; the new patent consisting simply in the introduction of an automaton rake, which, at regular intervals, by one rapid sweep, draws the corn on the platform together, and, with a quick turn, throws it aside in a loose sheaf out of the way of the machine. The mechanism by which this is effected is very simple, though, from its very simplicity, it is difficult to give a clear idea of it to the reader. Putting it in its briefest form, we may say that the wheels on which the old machine was drawn along, set in motion a mechanism by which the corn was cut close off at the ground, and, at the same time, revolved a light four-armed wooden fan or gleaner, which, as fast as the corn fell, pushed it on to the platform. This, in substance, is the old machine. The new one consists in an addition of the automaton rake, which has two actions. During one part of the revolution of the gathering fans, it acts with and as one of them, till its wooden teeth are level with the platform where the cut corn lies. It then ceases to revolve, and, by a most ingenious piece of mechanism, makes a sudden horizontal movement, throwing aside, on to the ground, the entire sheaf, and instantly after resuming its motion as one of the revolving fans. This machine was publicly tried in the presence of a number of gentlemen farmers, about three miles beyond Hemel-Hempstead. This trial was made under the most unfavourable circumstances; in fact, under circumstances which, the farmers present contended, should have prevented the machine from being tried at all. The night and morning had been very wet, and the rain was still falling, when the machine, drawn by two horses, and wielding its fans and rake in the most aggressive manner, was brought to a field of twenty-one acres, covered with a heavy crop of red lammas wheat, completely saturated and bent down by the wet. Along the edge of this field, where the ground was very rough, and the corn straggling and beaten down, the machine was turned. Much misgiving was expressed, before starting, as to the power of the rake to act on such ground against wind and rain, and to remove the soddened crop from the platform into regular sheaves. A very few moments, however, sufficed to put these fears at rest. The reaper went to its work about three miles an hour, making a clear cut broad track of 5 ft. 6 in. wide, and turning out neat and remarkably large loose sheaves, at intervals of about 15 ft. apart. The movements of the reaper were exact and perfectly noiseless, and it was easily turned in any direction. An ordinary agricultural labourer at first drove it. Afterwards Mr. Dixon took the place of driver; but the results were the same. The bunches were well laid; the cut was clean and close to the earth; and the spacing between the sheaves as clear and accurate as if every foot had been measured. At one part the corn was tangled, and badly flattened—badly enough to have presented difficulties to the ordinary reaper; but the machine went through it with the same ease and regularity as through all the rest. The horses were then turned direct and across the thickest part of the crop, from corner to corner of the field; and though, as a

matter of course, the passage of the animals drawing the machine trampled down a large portion of the stalks before its track, the reaper still worked as clearly and efficiently as ever. First came one of the fans, pushing its *quantum*, when cut, on to the platform; then a second, third, and fourth, when the rake swept round in a semi-curve, and turned the whole mass out in a thick sheaf on to the ground. The horses appeared to draw it easily—more easily, in fact, than the old machine; while, from the strength and simplicity of the improved mechanism, it was evident that, even in the most inexperienced hands, nothing but wilful damage could derange its slight but strong machinery. It is estimated that this reaper can reap and stack, in sheaves, from sixteen to eighteen acres of wheat per day, at a cost, including wear and tear of plant, food of horses, &c., of 1*s.* 6*d.* per acre. Manual labour costs from 7*s.* 6*d.* to 10*s.* per acre; and a good reaper averages only from half to a little over half an acre a-day. The new machine effects a saving of, at least, one-third of the manual labour that was still necessary with the old reaper; and the price at which Messrs. Burgess and Key will be able to sell it, will be lower than that which has hitherto been charged—probably about £34.

ROLLERS.

A universal-jointed land-roller, invented, improved, and manufactured by Mr. Nicholson, is a three-part plain roller, constructed on an entirely new plan, to adapt itself to the ground, however rugged or uneven the surface, or high or irregular the ridges, thereby overcoming the great defect of all ordinary land rollers. By an ingenious arrangement of universal joints, each part will move up or down, or at any angle, independently of the others. Price, 18 in. diameter, to cover 7 ft. of ground, £11; driving seat, £1 extra.—Messrs. Woods and Cocksedge have constructed a double barley roll, to which has been awarded a prize of ten guineas by the Royal Agricultural Society of England. It is designed for rolling spring corn, and is so constructed as to obviate the evil complained of with those in common use, which, in turning, are apt forcibly to displace the soil, and disturb the new-sown seeds. This implement has become one of general utility to the farmer, from its application to so many purposes as a roll. Price, £8 8*s.*—Amies and Barford have a new implement, called a Water Ballasting Roller. It is made with two separate water-tight cylinders of best wrought iron, which can be filled at pleasure. A removable plug is let into the solid plate, so that a tube or hose-pipe can be inserted, and the cylinders filled in two or three minutes. When full weighted this roll reaches 25 cwt.; when empty it is about 12 cwt., so that a two or three-horse roll is secured in one implement. The size of the cylinders is 27 in. by 6 ft. 6 in. Price, £17 10*s.*—Mr. Cambridge has a patent double-action press-wheel roller and clod-crusher, to which was awarded the Royal Agricultural Society's prize at the Warwick meeting. It is composed of a number of patent plain wheels; and a serrated or notched wheel, of peculiar construction, is placed between each plain wheel, by which arrangement the effective action of the best clod-crusher and wheel-roller are combined. It is 6 ft. wide, with 26-inch wheels. Price, £14.

ROOT-WASHER.

Mr. Croskill has an improved Archimedean root-washer, consisting of an open cylinder partly immersed in water, containing an Archimedean screw. The potatoes, roots, &c., are put into a hopper; and as long as the cylinder is turned round in one direction, they remain in it, and are well cleaned; but when the handle is reversed, the Archimedean screw brings them out of the cylinder without the necessity of lifting it out of the water, as in all other root-washers. Price, £5 10*s.*

SACK-BARROWS.

A combined sack-barrow and elevator, invented, improved, and made by Amies and Barford, is a convenient implement. By its aid one man can fill, tie, and remove a sack of corn with ease, thereby doing the work of three men at a great saving of time and money. For corn-factors, maltsters, merchants, wharfingers, coal-wharves, and farmers' use in general, this machine is found invaluable, as also for facilitating the removal of corn from a steam thrashing-machine. To prevent the possibility of breakage, the best malleable iron

racks are now substituted for cast iron ones. Price, £3 5*s*.

SOWING MACHINES.

A grass and seed broadcast sowing machine, invented, improved, and manufactured by Barrett and Exall, consists of a box 12 feet long, with a spindle running through the centre of it, on which are fixed brushes working against copper regulators, and a barrow, on which the box is placed transversely when fixed for work. The barrow-wheel drives all the machinery, and the quantity of seed is regulated at pleasure. Price, £3 3*s*.—A broadcast corn-distributor, invented and manufactured by Gower and Son, is quite a new implement, and has been brought out to supply a want in wet seasons—of a machine to sow when the use of a drill is impracticable. Two men, or a man and a lad, can sow with it more expeditiously, and with much greater regularity, than by hand. Price, £5.

STEAMING APPARATUS.

A fixed steaming apparatus for large farms, gaols, unions, asylums, &c., was invented by the late W. P. Stanley, of Peterborough, and improved and manufactured by Messrs. Amies and Barford. It consists of a strong 2-horse power boiler or steam-generator; two 100-gallon boiling or compound pans, made of strong galvanised iron, for boiling water, cooking, washing, brewing, and other domestic purposes; also for preparing linseed meal, and other compounds for cattle, horses, and pigs; two 12-bushel galvanised chaff or root pans; strong brass feed-pump for boiler, with all pipes, cocks, and fittings as fixed. A similar apparatus is in constant use at the Northampton, Cambridge, and Arlsey asylums; the Strand and Poplar unions, London; and nearly 200 other public and private establishments. Price, £80; wood and felt lagging to the boiler, £5 10*s*. extra.—Another, called the farmer's portable steaming apparatus—invented by the same gentleman, and sold by the same maker—received the prize of 300 francs and a gold medal at the Paris Exposition; and more recently distinguished at the public trials open to all England at the North Lincolnshire shows, and at every other local show where it has been subjected to competition. It consists of a strong wrought iron portable boiler or steam-generator, with an improved oval flue of Lowmoor iron, one 6-bushel root pan, and 40-gallon compound pan, as fixed. Price, £27 10*s*.; water-gauge, 20*s*. extra.—Mr. Thompson, also, has a paragon portable steaming apparatus, which combines every improvement for steam-cooking for agricultural purposes, or for asylums, or other large establishments: the boiler is constructed to produce the necessary steam with a minimum quantity of fuel; it is fitted with a steaming-pan to contain six bushels of roots, and a 40-gallon copper boiler, in wood tub, for boiling linseed compounds, soups, &c., by steam; but the apparatus may be arranged, in various other forms, to suit any particular requirement. Price, complete, £21 10*s*.

STEAM CULTIVATORS.

The patent steam plough and cultivator, with windlass and rope-porter, manufactured by Messrs. Fisken, Newcastle-upon-Tyne, takes its place among other agricultural mechanical improvements. It is a three or four-furrow plough, on the balance principle, capable of being used as a cultivator. The peculiarity of the apparatus is, that the power is transmitted from the engine by an endless rope, acting on self-moving anchor-windlasses, so that the plough is dragged directly from one windlass to another. Price, £150.—A new implement, called a regulating windlass, invented, improved, and manufactured by Messrs. Hancock and Co., has also a claim upon the notice of the agricultural world The hauling-drums are tied to, and mounted on, independent shafts; and each drum is acted on by "clutches" of two speeds, by which the speed of the implement is adapted to the power of the engine without stopping. It is a common 8-horse power engine; is enabled to master all the difficulties of steam tillage; and by which the land can be tilled to a greater depth by a light engine than heretofore. In hauling implements up hill, or through heavy or wet patches of ground, the speed can be two miles an hour of the implement up hill, the engine working equal to 16-horse power; and four miles an hour down hill, the engine going at 8-horse power, or any speed that may be required Price, £100.

STEAM-ENGINES.

There are, no doubt, some who look upon the introduction of a steam-engine into rural matters, with the same kind of horror that the poet Wordsworth did the invasion of a railway into his own lake scenery. A steam-engine may not be, perhaps, an object for poesy; although we do not see, if treated in the right way, why it should not be considered worthy of poetical illustration quite as much as the many rural objects which have so long been sung in the poet's song. There is nothing in a spade, *per se*, poetical, or in a plough. They have been merely rendered so. The labourer himself is only poetical afar off; and few will care for a closer connection, especially after a day's toil. When the eye has become used to the steam-engine in the field, and the ear to its puffing and snorting, some poet may arise to clothe it "in liquid lines mellifluously bland," and thus give to it a poetical name and habitation. Our business, however, is to deal with it practically. A steam-engine, as compared with the human or equine machine, is more useful, economical, time-saving, and money-making. There is a limit to the labour of man, and the drudgery of the horse. Each requires rest to recruit exhausted nature; but the steam-engine knows not fatigue. Feed it with the "black diamond" drawn from the bowels of the earth, and, so long as the supply lasts, the engine plies its ceaseless toil. It cares not for sunshine or rain. The storm passes over unheeded; and it knows no distinction between night and day.

Fixed engines have been in use some time in the north. It is only within the last fifteen years that movable engines have been brought into use through the instrumentality of the Royal Agricultural Society, as being more convenient; for, with a fixed engine, the produce has to be taken to the barn; while, with a movable one, the corn may be at once thrashed out in the field. A saving is thus effected in time, in labour for the tenant, and in buildings for the landlord, fewer being required for storing, &c. One of the principal points to be taken into consideration as to the efficacy of an engine, is the amount of the consumption of fuel; and even, in 1851, great progress had been made: for, as stated in the report of the Exhibition, "our best engine now consumes less than 8 lbs. of coal per hour per horse-power; whereas an engine made by the winning manufacturer of four years ago, consumed 28 lbs.; that is, four times as much fuel for the same work."

Now, however, there are portable steam-engines in the field. Messrs. Aveling and Porter; Barrett, Exall, and Andrews; Burrell, Brown and May, Clayton and Shuttleworth, Garrett, Gray, Hornsby, Humphries, Ransome and Sims, Robey, Ruston, Turner, and Tuxford, are all makers of portable engines. There are also fixed engines, which, under the requirements of modern farming, may, in some circumstances, be of more avail even than portable engines for carrying out the necessary operations. It is unnecessary to particularise the merits of all these makers' machines. They are well known. We may, however, notice a 10-horse-power patent portable steam-engine, invented by Messrs. Biddell and Balk, of Ipswich, and improved and manufactured by Messrs. Ransome. This engine is fitted with Biddell and Balk's patent boiler, which is so constructed, that the fire-box, tubes, and tube plates can be taken out all in one piece, and put in again, with facility; the advantages of this boiler being facility of cleaning, inspection, and repairs. The boiler is proved to 100 lbs. pressure on the square inch. The crank shaft is of wrought iron; the bulk of the plates are Lowmoor, the others being best Staffordshire. Price, £280; steam-gauge, 60*s.*; pulley, extra.

THRASHING MACHINES.

This is the most complicated agricultural machine in general use. Before 1829, so great was the imperfection of farm machinery, that, technically speaking, the duty performed was 25 per cent. only. But the application of steam has induced improvement in all kinds of machinery, and in none more than in thrashing machines. So great, indeed, have been the improvements, that they may be considered as equal to new creations. The corn now is commonly delivered from the stack upon the machine, and then from the machine into sacks ready for market—a great saving of time and money. These implements received due notice at the Exhibition

of 1851, and prizes were awarded to Messrs. Garrett, Hensman, and Holmes; and though not now possessing actual novelty, there have been so many improvements effected, that the present machine is almost a new invention. The Messrs. Garrett, instead of three blasts, have now contrived one blast, by which the currents of air are conducted through separate channels to dress the grain. The machine is, in consequence, much simplified in its construction, and requires less power to drive it. Messrs. Barrett, Exall, and Andrews manufacture a finishing-machine, with their perforated beater drum, and the patent corn-elevator, which dispenses with the ordinary tin cups; there is less wear and tear, and the working gear is more simple.—Messrs. Clayton and Shuttleworth's improved machines are fitted with a centrifugal-force corn-elevator, which dispenses with six driving-pulleys and three driving-bands.—Messrs. Hornsby's has only one belt for working, giving three dressings with two blasts.—There are also only two running spindles and four pulleys; the machine is fitted with a centrifugal-force elevator, and a new differential shaker.—Messrs. Ransome and Sims have introduced a new rotary shaker, which separates the straw, carries back the grain to the dressing part of the machine, and carries away the straw. There is also an adjustable rotary screen, which separates the good from the light corn.—Messrs. Turner have a small machine which may be worked by a 4-horse-power engine.—There are also machines made by Messrs. Burrell, Gibbons, Gray, Holmes, Humphries, Robey, Ruston, Tasker, and Underhill. In connection with the thrashing machine, a new implement has been brought forward within the last few years. It consists of a frame, on which is a straw-elevator: the straw thrown from the thrashing machine is received upon the elevator, and is carried by an endless revolving band, with projecting spikes, to a height of 20 feet, and upwards, doing the work of several men in stacking the straw. The old winnowing machine has not been altogether superseded by the thrashing machine; but, in an improved condition, still keeps its place, being better adapted for small holdings than an implement which can only be worked by steam-power. Nor has the steam-power machine thrust out the horse thrashing machines. They are useful on small occupations, and continue in great demand on the continent, where the system of farming has not reached the standard that is required in this country. Many of these useful machines are still manufactured by some of the largest implement-makers.

TURNIP-CUTTERS AND PULPERS.

A root-cutter, invented and improved by G. A. Biddell, of Ipswich, and manufactured by Messrs. Ransome, is an excellent machine. The knives remain stationary, while the hopper revolves on a vertical axis. By this arrangement great freedom of cut is attained, and it is impossible for the last piece to escape without being cut. It works easily, and cuts roots at a rapid rate. They are made to cut slices, finger-pieces of different sizes, and very thin strips. Price, £5 10*s.*; wheels and handles, 12*s.* extra; pulley for steam-power, extra.—A patent root-pulper, invented by the late F. Phillips, of Brandon, improved and manufactured by Woods and Cocksedge, has been awarded several prizes by the Royal Agricultural and other societies. This machine has been perfected, and is now offered as the most simple and effective implement for pulping of roots. All complicated parts are done away with; there is no worm or cutter-block; and no oscillating motion is required to assist the cutting-barrel in reducing the largest roots to a fine regular mince. This is a small-sized machine for limited occupations, for stables, or where one or two cows are kept. Easily worked by a lad. Price, £3 10*s.*—Another, of larger size, by the same makers, has the cutting-barrel or cylinder 12 inches in diameter, 14 inches in width, and is constructed entirely of iron; each tooth being fixed in separately, and secured by a wooden wedge, so that any common labourer may replace the teeth at a cost of a penny each, without taking the barrel out of its bearings. It will cost considerably less to keep in repair than any other turnip-cutter yet made. Price, £4 15*s.*—Another, fitted with brass bearings, and made stronger for increased power, will cut a very large quantity with greater ease than any other machine of the kind, as has been proved at the trials of the Royal Agricultural and other societies. This size is especially adapted for

stock-feeders. It produces a perfect pulp, without in any way bruising or smashing the roots, or destroying or losing the juice—a most important feature. Price, £5 10*s*.—Another, with a 20-inch barrel, will perform a very large quantity of work when attached to steam-power, and is especially adapted to large stock-feeders. Since the first introduction of Phillips' root-pulpers, several thousands have been sold to the first agriculturists of every country in Europe. One of their best qualities is, that they never clog, and seldom get out of repair; and in case of accident to the teeth, these can easily be replaced at the cost of one penny each. Price, £7 10*s*.—Messrs. Perksly and Sons have a root-pulper, which is a new implement. It is constructed with a double cone cylinder formed of perforated steel plates, with gauge or diamond-shaped cutting-points: the ends of this cylinder, being larger than the centre, discharge the pulped matter as rapidly as it falls into the interior, without the assistance of an iron weight, worm, or other contrivance, hitherto ineffectually employed for such purpose. The cutting-plates are fixed upon the cylinder in sections, and are cheaply and easily replaced by duplicates in cases of accidental breakage. It will perform a greater amount of work, more efficiently, and with less power, than any other machine of the kind, and is less liable to breakage, and more readily and cheaply repaired. The frame and other parts of this machine are of iron. Price, £5 10*s*.

WEED EXTIRPATORS.

A poppy and weed-extirpator and fertilising lever harrow, invented by the late Fred. Phillips, Esq., of Brandon, and improved and manufactured by Woods and Cocksedge, has been awarded a silver medal by the Royal Agricultural Society of England. It loosens, by its gentle action, hidebound lands, making them tender and friable; opening countless millions of pores to the influence of the atmosphere, promoting vegetation, and bringing fresh nourishment to the plant. No farm should be without it, as the extra produce on a few acres will more than repay the cost in the first year. Iron frame and levers. Price, £8 10*s*.—Another, called a Weeding-Paddle, or Thistle-Destroyer, by Reeves, has been awarded a silver medal at the Royal Agricultural Show at Leeds. It is simple, and used the same as a common weeding-paddle, which, at the same time as it is pushed into the ground to cut off the weed, discharges a portion of salt on the bleeding root. The salt thus penetrating the roots, effectually destroys them. It is portable, and is easily used as a common paddle. Price, 10*s*. each.

WEIGHING MACHINES.

A three-ton cart-weighing machine, improved and manufactured by Mr. Mason, is fixed level with the ground, so that a cart can be easily weighed, or any ponderous article. It is also fitted with a pen for weighing cattle; will weigh from 1 lb. to 3 tons; and is taken out of gear by a lever, so that it cannot be injured when out of work. Price, £21; with pen for cattle, £2 10*s*. extra.—Another portable machine for weighing cattle alive, is set on wheels, with large platform and guard, to weigh 15 cwt. with mall weights. Price, £9. —Another, for weighing pigs and sheep alive, is adapted for all general purposes by removing the guard and balance-weight, which is done in an instant: having a large platform or scale, it can be used either for corn, wood, or any bulky article. Price, £4 10*s*.—Another, adapted for the same purpose, but on the lever principle, only requiring small weights, is made by the same manufacturer, to weigh 4 cwt. Price, £4.—A combined sack-holder and weighing machine, invented by John Spencer, and improved and manufactured by Mr. Mason, will enable sacks of corn or other products to be filled and raised, by a rack and pinion attached to the machine, to the height required for carrying off on the back. Price, £5 5*s*.

WINNOWING MACHINES.

The manufacturers of implements of this description are Messrs. Hornsby, Gooch, Garrett, Dray, Coleman, Sawney, Caborn, Campain, and Hunt. On these machines generally, the report of the Exhibition of 1851 contained the following remarks:—"Even winnowing is becoming a refined process; for, instead of trusting the corn to the wind, it is now placed in a machine so discriminating, that the best of these—Messrs. Hornsby's—required, on the part of the judges at the York meeting,

specific terms for describing its work, more than are easy to understand." It then goes on to say—"Messrs. Hornsby and Son are, above all others, the most successful in these machines, dressing more than double as much corn as any other in a rough state; it is also excellent for finishing the corn for market; we, therefore, awarded it a medal." Price, £13 10*s*. This machine received a prize at Carlisle. The report then adds—"Mr. Gooch exhibited a machine which did its work well."—Messrs. Garrett have several corn-dressing machines, which were highly commended at Carlisle, the price varying from £7 10*s*. to £12. Extra sieves may also be obtained for beans, peas, &c.—Messrs. Dray have a patent grain and seed-separater, invented by G. Salmon, of Illinois. The judges at Carlisle said of this —"We consider it likely to throw a new light on dressing machines. Its performance in the hands of its inventors was wonderful; but it must be seen to be appreciated. We awarded it a medal."—Messrs. Coleman have corn-dressing machines; prices varying from £7 10*s*. to £8 10*s*.: and Messrs. Caborn have also a machine—the price being £14.—Mr. Sawney's winnowing machine is priced at £8 10*s*.—Mr. Campain has a very complete machine, price £25. This includes a patent elevator, which raises the dressed corn by a revolving band, to which are attached tin troughs. These receive the corn as it is dressed, and, raising it, deliver it into a sack placed to receive it. A very considerable saving of time is thus effected.—Mr. Hunt's engine for drawing clover and trefoil seed was considered worthy of especial mention at Carlisle, and had a silver medal awarded to it. This machine separates the husk from the seed, at the rate of from two to three bushels of clover per hour, and from four to six of trefoil seed. It is mounted on a pair of wood or iron travelling wheels, and a pair of draughts are attached, so as to render it portable. The net price for steam-power is £25; for horse-power, £27; and the travelling wheels, with draughts of iron or wood, from four to five guineas extra. Numerous testimonials of merit have been given for its efficiency and superiority.

In closing the account of these valuable implements, we cannot do better than give the sentiments of the Jurors of the Exhibition of 1851, which are just as applicable now, as they were then:—"Adopting the standard of economy as the test of their merit, we find that if a ploughing be valued at 8*s*., they can save 7*s*. an acre yearly over the whole of an arable farm; and we may adopt this calculation in their favour more confidently, because, by other means, an equal saving of horse-work can be made at other seasons in other descriptions of work. Some exceptions to this general use of cultivators will occur, of course, to every farmer; but the substitution of them for the plough has long been known to many good farmers, though probably it has not, as yet, been carried out upon system by any one of them to its fullest extent."

CONCLUSION.

Whatever strides have lately been made in the science of chemistry and the improvement of mechanics, as applied to agricultural operations, there is yet another subject which, under the name of Meteorology, ought to claim the serious attention of those who are occupied in the cultivation of the soil. As in other matters connected with agriculture, the first step in improvement, or the first advance in the acquisition of any views of practical importance, has been made in Scotland; so, on this point, the men of the north have, for some time, busily interested themselves in establishing a system of observations of what may be generally termed meteorological occurrences, which cannot fail to be of great value in guiding the agriculturist in his course. It must be evident, that to be of any practical use, such observations cannot be confined to one spot, but must be carried out over a large extent of country. Every one in his own neighbourhood, with but little trouble, can add to the general stock of knowledge, and thus the book of nature will be gradually unfolded. A great fact will then be made apparent to the comprehension of the farmer; namely, that he must not look to the result of a favourable or an unfavourable season—to the chances of war or famine—to the supplies that may come from other countries, to bid him down as it were in his own;—but that he must extend and enlarge his views; and he will then find that, if he grounds his calculations upon reasonable expectations, the laws

of nature will be found sufficiently firm and invariable to afford him every hope that his labour will not be lost, if, at the same time, he takes advantage of the science and skill which have already opened their resources for his use. The variableness of climate, in these islands, arises from causes of easy explanation. There are disturbing forces, on the one hand, from the vast tract of land comprising the continent of Europe; and, on the other, from the extensive influence of the Atlantic Ocean. The changes that we thus experience are dependent on elements existing afar off From the cold and inhospitable steppes and tracts of Russia on the one hand, and from the tropical warmth conveyed through the waters of the Mexican Gulf on the other, may be traced the influences that affect our climate. And thus it is found that the temperature is more equable than is felt in similar latitudes, either in America or on the European continent. But these elementary influences produce a marked effect on the characters of climate in those parts of our island that receive their impulse from one or other of these causes. Thus, on the west coast there is a larger quantity of rain-fall than on the east. Here, then, a rule for agricultural operations is at once arrived at. Cereal grains flourish better in the east; while grasses and green crops find a more genial climate in the humid atmosphere of the west. There are, besides, local causes affecting climate, but still dependent on these great outlines. It is from these peculiarities of local situations that information may be derived, which, by being classified, can be made generally useful in guiding the inhabitants as to the course to be pursued, so as to regulate their system of husbandry under the most advantageous circumstances. And we urge, therefore, upon the agricultural body, not to keep their attention confined to the chemistry and mechanics of agriculture—although, separately, each is of incalculable importance; and, combined, they have, within a few years, completed a total revolution in all the routine of the farm—but to study Nature and her laws; and there will be found such rules as cannot fail to point to the farmer how to act, so as to make the governing influences of the world in a manner subservient to himself.

DIVISION X.

THE PRACTICE OF HORTICULTURE.

CHAPTER I.

THE GARDEN OF EDEN; THE GARDENS OF HESPERIDES; THE GARDEN OF ALCINOUS; THE GARDENS OF CYRUS; GARDENS OF THE EAST GENERALLY; GRECIAN GARDENS; ROMAN GARDENS; VEGETABLE GARDENS.

THE GARDEN OF EDEN.

THE cultivation of a garden, as it is one of the most innocent, so must it have been one of the first of the employments of man. According to the sacred writings, our Adam and Eve were placed in Paradise, or the Garden of Eden; and profane historians and poets of the remotest antiquity, have bequeathed to us descriptions of gardens, redolent of the most enchanting beauty, and breathing fragrances capable of inspiring the utmost delight. Respecting the locality of some of these gardens, however, learned topographers are very widely divided. For example, the garden of Eden is supposed, by some, to have been situated in Armenia; by others, in Persia; by others, in Chaldea; and James Silk Buckingham informs us, that the people of Damascus implicitly believe that it was placed in the neighbourhood of their city. Happy belief! as it must impart to the reflective and dreamy mind of the Turk, the most agreeable visions of the long, long past. But the inhabitants of Ceylon declare that the garden of Eden was in their country, in which we know there is an Adam's Peak, rising to a height of 7,420 feet above the level of the sea; an Adam's Bridge, which consists of a chain of shoals extending across the gulf of Manaar, between the island and the peninsula; and a tomb of Abel. They have also a tree, the *Divi Ladner*, which, they say, bore the forbidden fruit, which still grows in great beauty, amidst an abundance of the most deliciously scented flowers, most inviting and tempting to all who behold them. The form of the fruit is such as to suggest the idea of a piece having been bitten out of the side by the sweet and innocent mouth of our first mother; and, to confirm this fact, the Ceylonese affirm, that the fruit was exquisite before this event took place, *though it is now poisonous*. Other countries have been chosen for the localisation of this celebrated garden; and a Swedish professor of the seventeenth century, composed a book to prove that Sweden was the happy land in which Eden had been placed. If so, it must have been very cold in winter.

THE GARDENS OF HESPERIDES.

Eastern nations, in general, must have taken great delight in gardens, from the manner in which their enjoyments are usually described. The gardens of Hesperides were placed in Africa, near to Mount Atlas, or, rather, somewhere among the valleys of the chain which goes by that name. They are described as situated in a spot upwards of 100 feet deep, and enclosed by very steep and almost inaccessible heights. In them grew apples of gold (oranges), pomegranates, mulberries, olives, almonds, walnuts, and grapes. The ornamental trees comprised the arbutus, myrtle, bay, ivy, and wild olive. They were inhabited by three celebrated nymphs, daughters of Hesperus, and guarded by a terrific dragon, which never slept. Here were—

> "Groves whose rich trees wept odorous gums and balm;
> Others whose fruit, burnish'd with golden rind,
> Hung enviable, Hesperian fables true,
> If true, here only, and of delicious taste."

Some writers have supposed these gardens to have been nothing more than the oases in

the desert; but whatever they were, or are in imagination, the vast exuberance of their odoriferous flowers, and the "thousand and one" enchanting charms with which the Greek mind, as seen in its poetical mythology, has invested them, have been thoroughly demolished by the ruthless hand of Lieutenant Beechy. It is a sad, but, we believe, an undeniable truth, as shown by this writer, that these famous gardens were nothing more than old stone quarries, out of which the material necessary to build the town of Berenice, now Bengazi, had been taken.

THE GARDENS OF ALCINOUS AND LAERTES.

The garden of the Phœnician king, Alcinous, is said to have been situated in an island of that name, supposed to have been Corfu, in the Ionian sea; but, wherever it was situated—whether in Corfu, or in some one of the Asiatic islands, as some suppose—its description, by the Homeric muse, is exceedingly beautiful. It lay close to the gates of the palace of the king; and was carefully defended from the inclemency of the weather by such means as may be supposed, at that time, to have been at the command of a powerful sovereign. It consisted of four acres, and was fenced all round with a green enclosure. It was planted, here and there, with fruit trees; and contained beds of culinary vegetables, and some borders of flowers. The poet, however, describes it in much warmer terms than we are attempting to do. Here the reddening apple ripened into gold; and—

> "Here the blue fig with luscious juice o'erflows,
> With deeper red the full pomegranate glows;
> The branch here bends beneath the weighty pear,
> And verdant olives flourish round the year.
> The balmy spirit of the western gale
> Eternal breathes on fruits, untaught to fail;
> Each dropping pear a following pear supplies,
> On apples, apples, figs on figs arise;
> The same mild season gives the blooms to blow,
> The buds to harden, and the fruits to grow."

Besides its fruits and flowers, it contained a couple of fountains, or wells; the one for the use of the palace, and the other for watering the garden.—The garden of Laertes was similar to that of Alcinous; and they are both described in the *Odyssey*.

THE GARDENS OF CYRUS.

The Babylonian or Assyrian kings seem to have possessed a remarkable predilection for magnificent gardens. Those of Cyrus, the founder of the Persian empire, have frequently been described. According to Mr. Loudon, who condenses from Dr. Falconer, the form of these gardens was square, each side having a length of about one hundred feet, and the whole giving an area at the base of closely upon four acres. "They were made to rise with terraces, constructed in a curious manner above one another, in the form of steps: and were supported by stone pillars to the height of more than three hundred feet, gradually diminishing upwards till the area of the superior surface, which was flat, was reduced considerably below that of the base. This building was constructed by vast stone beams, placed on pillars of stone (arches not having then been invented), which were again covered with reeds cemented with bitumen, over which was placed a double row of bricks united by cement. The bricks were covered with plates of lead, which effectually prevented the moisture from penetrating downwards. Above all, was laid a coat of earth, of depth sufficient for plants to grow in it; and the trees planted there were of various kinds, and were ranged in rows on the side of the ascent, as well as on the top; so that, at a distance, it appeared as an immense pyramid covered with wood. The situation of this extraordinary effort of human skill, aided by wealth, was nearly adjoining to, or upon, the river Euphrates, from which water was supplied by machinery, for the fountains and reservoirs employed for cooling the air, and watering the gardens." Yet the monarch whose power and wealth enabled him to construct these wonderful monuments, was as deeply impressed as the most reflective philosopher could be, with the fast-fleeting glories of all earthly materialities. Saadi, in his *Gulistan*, copies the inscription which Cyrus ordered to be put upon his crown. "What avails a long life spent in the enjoyment of worldly grandeur, since others, mortal like ourselves, will, one day, trample our pride under foot! This crown, handed down to me from my predecessors, must soon

pass in succession to the heads of many others." Remarkable as this may be, it is not nearly so striking as his epitaph:—"O man! whoever thou art, and wherever thou comest (for come I know thou wilt), I am Cyrus, the founder of the Persian empire. Envy me not the little earth that covers my body." Peace to his manes!

GARDENS OF THE EAST GENERALLY.

From the foregoing descriptions, it will readily be inferred, that gardens, among the Asiatics generally, were objects from which great pleasure was received; and hence the reason that they are so frequently spoken of by the inspired writers in such a way as to illustrate subjects of a spiritual or heavenly nature. One of the first essentialities of an Eastern garden seems to have been elevation of situation. "When Semiramis came to Chanon, a city of Media," observes Diodorus Siculus, "she discovered, on an elevated plain, a rock of stupendous height and considerable extent. Here she formed another paradise, exceedingly large, enclosing a rock in the midst of it; on which she erected sumptuous buildings for pleasure, commanding a view of both the plantations and the encampment." The existence of these gardens, however, has been questioned; and so has even that of Queen Semiramis.

Looking back to a period 1500 B.C., Solomon's gardens necessarily come into view. The form of this plot was quadrangular; and it was encompassed by a high wall. It was adorned with plants of various descriptions—curious as objects of natural history, such as the hyssop: but it was also fragrant with the rose, the lily of the valley, cinnamon, spike-nard, camphire, saffron, and other plants. Its timber trees were the cedar, the pine, and the fir. Its fruits were the pomegranate, the fig, the grape, the apple, and the date. No doubt, like Milton's Eden, it was supplied with grots and caves of cool recess, over which the mantling vine—

> "Lays forth her purple grape, and gently creeps
> Luxuriant; meanwhile murmuring waters fall
> Down the slope hills, dispersed, or in a lake,
> That to the fringed bank with myrtle crown'd
> Her crystal mirror holds, unite their streams."

In the hotter parts of Eastern countries, a constant supply of water is so necessary, that were the application of this precious beverage to be denied to a garden but for a few days, everything in it would be literally burnt and destroyed. There is, therefore, in these parts, no garden whatever without a certain supply of water, obtained either from some neighbouring river, or from some reservoir, either collected from springs or filled during the rainy season, to an extent sufficient to yield an ample quantity for the rest of the year. As a general description of the manner in which an Eastern garden is laid out, that of the Emir of Berytus may be taken. Referring to this piece of art, Mr. Maundrell, in his *Travels*, says—"The best sight that the palace affords, and that which is most deserving of recollection, is the orange garden. It contains a large quadrangular plot of ground, divided into sixteen lesser squares, four in a row, with walks between them. The walks are shaded with orange trees of a large spreading size. Every one of these sixteen lesser squares in the garden was bordered with stone; and in the stone-work were troughs, very artificially contrived for conveying the water all over the garden, there being little outlets cut at every tree, for the stream, as it passed by, to flow out and water it." Kempher describes the royal gardens at Ispahan as being watered in a precisely similar manner.

GRECIAN GARDENS.

The Greeks, original, elegant, and refined in most things, yet copied the Persians in gardening. We are informed by Diogenes Laertius, that the philosopher Epicurus took great delight in a garden, and chose such a scene for teaching his principles. This plot was in the city of Athens; and he is stated to have been the first who introduced the charms and enjoyments of trees and flowers into the heart of a city. Thus the pleasures of country life could be experienced without the necessity of going out of town, and those of town life might be participated in without having to go into the country. This was in accordance with the philosophy which teaches that happiness consists in pleasure, not certainly altogether of the pleasures of sense, but of that species of pleasure which would

deny an energetic activity to the faculties of the mind. The Athenians, however, enjoyed both the philosophy and the flowers, among which were the narcissus, the violet, and the rose. "The rich and polished Athenians," observes Gilbert Laing Meason, "preferred a residence in the country, that they might withdraw themselves from the jealousy of envious citizens. In villa gardening they borrowed from Asia Minor. They had myrtles and roses; the box and the lime tree were planted for topiary works: and Theophrastus tells us that flowers and fruits were cultivated in the winter; and that the violet was in profusion in the market of Athens while snow was on the ground." The cemeteries of the Greeks may be included in their public gardens; and groves, and even the waysides, were sometimes chosen for the burial-places of public men.

ROMAN GARDENS.

The gardens of the Romans were similar to those of the Greeks, the one being a copy of the other. Those of the Emperor Nero partook of the appearance of one of our modern parks. Tacitus says—"Moreover, Nero turned the ruins of his country to his private advantage, and built a house, the ornaments of which were not miracles of gems and gold, now usual in vulgar luxuries; but lawns and lakes, and after the manner of a desert; here groves, and there open spaces and prospects; the masters and centurions being Severus and Celer, whose genius and boldness could attempt by art, what nature had denied, and deceive with princely force." The city gardens of the Romans seem to have been nothing more than small square plots in the fronts of their houses, enclosed with trellis-work, planted with espaliers, and ornamented with fountains, urns, and other sculptural works of art. Plants in boxes and pots appear, sometimes on the walks and window-sills; and over the doors there appear climbers, resembling honeysuckles. The size of the plots would seem to have varied, as they do with us, from a few square yards up to, perhaps, a quarter of an acre.

VEGETABLE GARDENS.

In the laws of the *Decemviri*, among the Romans the word *hortus* originally meant both a garden and a country-house; but, in the course of time, the word *pinguis* was added to it, when the conjunction of the two words signified a kitchen garden. We are informed by Cato, that the principal citizens had their *horti*, or garden-farms, in which they reared their vegetables, close to the city. In the earlier ages these farms were cultivated by the hands of their proprietors, as was the case with Cincinnatus; and the success of some of these dignified growers, in the culture of certain plants, suggested family names, not only for themselves, but for future generations. Thus we have Piso, from the pea, Cicero, from the vetch; Fabius, from the bean; Lentulus from the lentil; and others. If the owner had reared too large a crop of vegetables for his own use, the remainder was taken to the Fora Olitarum, and there exposed to sale. The principal culinary products cultivated by the Romans were cabbages, which were esteemed alike by the sovereign and the slave; turnips, carrots, beet, parsnip, radish, skirret, asparagus, sorrel, onions, and several kinds of garlic. Of leguminous plants, the pea, and the common, as well as the kidney bean, were cultivated. Of *salads*, endive, mustard, lettuce, succory, and others. Of *pot* and *sweet herbs*, dittander, alisanders, orache, parsley, fennel, elecampane, chervil, and a variety of others. Mushrooms were in repute; and although not vegetables, we may here observe, that bees, snails, and dormice had appropriate places assigned them, as necessary additions to the kitchen garden.

CHAPTER II.

PRELIMINARY OBSERVATIONS; NONESUCH; PROGRESS OF GARDENING IN ENGLAND; THE ROYAL GARDENS AT WINDSOR.

PRELIMINARY OBSERVATIONS.

By the time that the Roman commonwealth had ceased to exist, the catalogue of fruits then cultivated had risen to a considerable number. According to Hirschfeld, the Romans had received the almond and the fig from Syria, the citron from Media, the peach from Persia, the apricot from Epirus, the pomegranate from Africa; pears, apples, and plums from Armenia, and cherries from Pontus. The list was greatly extended by the numerous different species of some of these, and the principles of grafting and pruning were both understood and practised. Even the mode of generating heat, and applying it to the purposes of horticulture, seems to have been known; but, with the decline of the empire, garden cultivation also declined, or, at least, became stationary. Subsequently it seems to have sunk into the torpid state into which the whole of Europe had passed; but, with the revival of learning, it awoke from the long slumber of the dark ages, and, once more, began to unfold its innumerable charms to the eyes and imaginations of men. For some time it continued to be repressed by the dreams of alchemistical empiricism, the restrictions of unlucky days, and the supposed effects of lunar influences; but it gradually shook itself free from these chains of ignorance and superstition, and joined in the race of general improvement, which was fast taking place in society. Throughout Europe its advancement has been general; but in no state has it made greater progress towards its present condition, than it has done in Great Britain, where it has been cultivated with great steadiness, assiduity, and ardour, by men not only possessed of the means and position, but of the talents capable of developing the science in all its departments. It is to Britain, therefore, that we will chiefly confine ourselves in treating of this subject; and, also, more especially to the middle portions of the island, taking mostly, for our guides and authorities, such men as Dr. Lindley, the first of physiologists, and Mr. C. Mackintosh, the first of gardeners. Before entering upon this portion, however, we will notice a few of the royal gardens of England, briefly tracing the progress of the art down to the present time.

NONESUCH.

After the revival of gardening in England, it made great progress in the time of Henry VIII., who encouraged and patronised the art, to an extent commensurate with his means. It was in his reign that the royal gardens of Nonesuch were laid out and planted. In a survey taken in 1650, above a century after the death of Henry, these gardens are said to have been divided into several compartments, alleys, and rounds, intended, no doubt, as an exemplification of improving taste, and surrounded with thorn hedges. On the north side was the kitchen garden, and, on the west, a wilderness separated from a little park by a hedge; the whole containing ten acres. In the private gardens were fountains, and basins of marble, pyramids and statuary, representing various subjects. Indeed, it seems altogether to have been an extraordinary place for the age. Hentzner tells us, that "Nonesuch was built by Henry VIII., with an excess of elegance and magnificence even to ostentation; as one would imagine everything that architecture can perform to have been employed in this one work. There are everywhere so many statues, that seem to breathe; so many miracles of consummate art; so many casts that rival even the perfection of Roman antiquity, that it may well claim and justify its name of Nonesuch, being without an equal; or, as the poet sung—

> This which no equal has in art or fame,
> Britons deservedly do Nonesuch name.

"The palace itself is so encompassed with

parks full of deer, delicious gardens, groves surrounded with trellis-work, cabinets of verdure, and walks so embowered by trees, that it seems to be a place pitched on by Pleasure herself to dwell in along with Health. In the pleasure and artificial gardens are many columns and pyramids of marble; two fountains that spout water—one round the other like a pyramid, upon which are perched small birds that stream water out of their bills. In the grove of Diana is a very agreeable fountain, with Actæon turned into a stag (as he was), sprinkled by the goddess and her nymphs, with inscriptions. There is, besides, another pyramid of marble, full of concealed pipes, which spurt upon all who come within their reach." Such was the style of a royal garden in the time of Henry VIII. Taste, however, has entirely changed; and great as may be the opulence of modern garden proprietors, whether of the patrician or the plebeian orders, "statues that seem to breathe," where they do exist, do not take such a prominent place as they did in the days of "Bluff King Hal."

PROGRESS OF GARDENING IN ENGLAND.

Passing by the immediate successors of Henry, the art met with great encouragement from our Stuart kings. James I. greatly improved the gardens at Theobalds and Greenwich. Of the former, Mandelso, who visited this country in 1640, says—"It is a large square, having all its walls covered with phillyrea, and a beautiful *jet d'eau* in the centre. The parterre hath many pleasant walks, part of which are planted on the sides with espaliers and others, arched over. Some of the trees are limes and elms; and at the end is a small mount, called the Mount of Venus, which is placed in the midst of a labyrinth; and is, upon the whole, one of the most beautiful spots in the world." Lord Bacon, who himself had a fair garden, endeavoured to improve the taste of the time, but with little success. "As for the making of knots or figures," says he, "with divers coloured earths, they be but toys. I do not like images cut out in juniper or other garden stuff; they are for children." No great advance was made during the Commonwealth; but in the reign of Charles II. the art was improved. It was in this reign that Chatsworth, the splendid seat of the Duke of Devonshire, was laid out; and Daines Barrington thinks that garden buildings were first erected in England during this reign, at Beckett, near Farringdon; and the celebrated Inigo Jones was the architect. Evelyn flourished in this reign; and, by his writings and his taste in gardening, did much to improve the art.

During the reign of William and Mary, Switzer says that gardening had attained to the highest point of perfection; and we dare say that it is the opinion of many that such is the case at the present day. But any sudden revolution in the taste of the nation would change the whole of its features, now deemed beautiful and perfect, within the compass of a very few years. Daines Barrington informs us that King William greatly extended what is called *topiary-work*, which consists of giving fanciful forms to arbours and thickets, trees and hedges. This grotesque style was patronised by William, who loved to see clipped yews, accompanied with magnificent gates and rails of iron. The largest iron screens of this kind in England, after those of Hampton Court, were formed by Switzer, at Leeswold, Flintshire, the grounds of which were laid out by that artist in a mixed style. Mr. Loudon informs us, that Hampton Court being, at this time, the actual residence of the royal family, the gardens underwent considerable improvement. "An elegant alcove and arched trellis were added at the end of one of the alleys, and four urns placed before the principal part of the house—supposed, by Daines Barrington, to have been the first that were thus used in England. Towards the end of this century, vegetable sculptures and embroidered parterres were probably in their highest vogue—a conjecture confirmed by the works of Le Blond, James, Switzer, &c., published during this and the following reign." Longleat, the magnificent seat of the Marquis of Bath, was laid out in this reign.

In the reign of Queen Anne, the principal alteration which appears to have been made, took place in the royal gardens at Windsor, when the parterre before the great terrace was covered with turf. It was this queen who

caused the old gardens at Kensington, commenced by William, to be finished. Wise (of London and Wise, noted gardeners) was engaged for this purpose. He converted the gravel-pits into a shrubbery, laid out in meandering walks; the effect of which upon the mind of Addison was so great, that he elevated Wise to a comparison with an epic poet, considering the improved pits as episodes to the garden, which of course was, in the eye of the *Spectator*, the epic itself. Both London and Wise were nurserymen and designers, who enjoyed great popularity in their time. To them succeeded Bridgeman, who banished vegetable sculpture, substituting in its place wild scenes and cultivated fields. This was a better taste. He still, however, continued to clip his alleys, though he left to their natural growth the central parts of the masses through which they were pierced. "Blenheim, Castle Howard, Cranbourne, Bushy Park, Edger, Althorp, New Park, Bowden, Hackwood, Wrest, and, indeed, almost all the principal noblemen's seats in the ancient style, were laid out during this, the preceding, and part of the latter reigns, or between the years 1660 and 1713. Blenheim was laid out by Wise in three years. Wanstead in Essex, and Edger in Hertfordshire, were the last of London's designs.

Under the first of the Georges, gardening languished rather than improved; but under the second George, his queen enlarged and planted Kensington gardens. She also formed what is now called the Serpentine River, by uniting a string of detached ponds. This bold step was the precursor of subsequent changes in taste. It would appear from Daines Barrington, that Lord Bathurst informed him, that he (his lordship) was the first who deviated from the straight line in pieces of made water, by following the natural lines of a valley, in widening a brook at Ryskins, near Colnbrook; and that Lord Strafford, conceiving that it had been done from poverty, asked him to confess fairly how much more it would have cost him to have made it straight. In Mr. Loudon's *Encyclopædia*, it is stated that Christopher Wren (chaplain to Charles I., Dean of Windsor, and father of Sir Christopher Wren, the architect) claimed, as his, the invention of making serpentine rivers. In a marginal note, affixed to Sir H. Wotton's *Elements of Architecture*, published in 1624, he says—"For disposing the current of a river to a mightier length in a little space, I invented the serpentine, a form admirably conveying the current in circular, and yet contrary, motions upon one and the same level, with walks and retirements between, to the advantage of all purposes, either of gardenings, plantings, or banquetings, or very delights; and the multiplying of infinite fish in a little compass of ground, without any sense of their being restrained. In brief, it is to reduce the current of a mile's length into the compass of an orchard."

The extent of Kensington gardens, originally, was twenty-six acres, to which Queen Anne added thirty, and Queen Caroline nearly three hundred more, taken out of Hyde Park, and laid out by Bridgeman. Beckham, who wrote in 1742, says—"The gardens of Kensington Palace, which are three miles and a-half in circumference, are very fine; they have been much improved and enlarged since his present majesty came to the throne, under the care and management of the late ingenious Mr. Bridgeman. They are kept in the greatest order; and in the summer-time, when the court is not there, are resorted to by a vast concourse of the most polite company." Canons, the magnificent seat of the Duke of Chandos, is one of the principal places laid out in the ancient style during this reign.

Having thus traced the rise, progress, and decline of the ancient style of gardening in England, we will now, without entering into the disputed point as to the originators of the modern style, give, principally from Mr. Loudon, a brief description of the royal gardens at Windsor, as being, perhaps, the finest in this country.

THE ROYAL GARDENS AT WINDSOR.

Notwithstanding that Windsor Castle has been a royal residence since the time of William the Conqueror, we hear nothing of the garden till the time of Henry V., when James I., of Scotland, celebrated it in a poem whilst a prisoner within the walls of the fortress. In the reign of Elizabeth, the principal terrace was formed on the north side of the castle; and in that of Charles II., this same terrace was extended round the east,

and a part of the south front. During the reign of William and Mary, the Little Park was enclosed by a brick wall, and avenues of elms and clumps of forest trees planted. This was continued to be done by Queen Anne; but not one of these august personages seems to have thought anything about a garden. Although plans seem to have been suggested for furnishing the castle with gardens and pleasure-grounds, they do not appear to have borne fruit. Whately, the author of *Observations on Modern Gardening*, wrote, in 1772, a paper upon the subject, which he left in manuscript, and which, many years afterwards, came to light in the *Gardener's Magazine*. In this paper he says—"A more magnificent and delightful royal residence can hardly be imagined than that of Windsor Castle. The eminence on which the castle stands is detached from every other, and advanced into the plain which it commands; it falls in a bold slope on one side, while it is easy of access on the other; and, as the palace occupies almost all the brow, the whole hill seems but a base to the building. It rises in the midst of an enchanting country, and it is there the most distinguished spot; but though the situation is singular, it is not extravagant; it is great, but not wild. It is in itself noble, and all around it is beautiful. The view from the terrace is not the most picturesque, but it is the gayest that can be conceived. The Thames diffuses a cheerfulness through all the counties where it flows; and this is, in itself, peculiarly cheerful. It is luxuriantly fertile; it is highly cultivated; it is full of villas and villages, and they are scattered all over it—not crowded together. No hurry of business appears, and no dreary waste is in sight. Country churches and gentlemen's seats are everywhere intermixed with the fields and the trees. Every spot seems improved, but improved for the purposes of pleasure. All are rural, none are solitary: and the amenity of the plain is, at the same time, contrasted with the rich woods in the Great Park—their height, their shade, and their verdure."

This enthusiasm of Whately is by no means undeserving his theme; for, in reality, the whole domain which encircles the castle of Windsor, is, perhaps, not only the most beautiful, but the most magnificent in Great Britain. The Great Park has a circumference of eighteen miles; and both it and the Little Park are studded with large trees, mostly arranged in avenues. It is observed by Whately, that the space which these avenues enclose might be divided into three parts. "The declivities of the hill towards Frogmore and Datchet are comprehended within one of these divisions; the level from the foot of the hill towards Datchet, constitutes the second; and all the plain which borders on the Thames, from Datchet to Eton bridge, is included in the third." Mr. Loudon observes, that, in the first of these divisions, the ground varies considerably. Ancient oaks and lofty elms are scattered about, sometimes crowning the brow of the descent, and at others giving richness to the valleys. Among these trees appear different views of the towers of the castle; and, from some points, two fronts may at once be seen in perspective. The beauties in the second division are of a tamer character. The castle is entirely hid; and the principal point of importance is a little water-course, which might easily be converted into a rivulet. The plain between the castle and the Thames is remarkably rich; and it is on this side that the slopes are situated, which, in the latter part of the reign of George III., were turned into a garden. On the other side of the Great Park stretches Windsor Forest—a vast tract, which exhibits almost every possible variety of scenery. The slopes, which form the declivity of the hill, making the north terrace, were first enclosed in the reign of George III.; but about eighteen acres of pleasure-grounds adjoining them were subsequently laid out.

In the reign of George IV., a grant was obtained for making improvements in Windsor Castle; and a *suite* of apartments was built, under the direction of Sir Jeffery Wyatville, a new terrace being formed in front of them, which was carried round a small flower-garden. This garden comprises between three and four acres; and is twelve or fifteen feet below the level of the new terrace, which is on the same level as the old terraces. The descent to the garden is by two flights of stone steps. The orangery is formed under part of the terrace, and has an opaque roof. It is lighted by upright windows, after the manner of the old

orangeries at Kensington and Versailles, facing the south and south-west. It follows, from this arrangement, that those walking on the terrace round the flower-garden, look down on its arena of grass, and beds of trees and shrubs on the one hand; and outwards towards the splendid park scenery on the other. The effect thus produced is dignified and grand, and well suited both to the castle and the situation. The slope is grass; and the greater part of the level surface of the garden is in grass also, with beds of shrubs and flowers parallel to the walks. There is also a slope of turf from the inner edge of the terrace to the level arena of the garden. Several years after the foundation of this garden, it received the addition of a number of marble vases and some statues, nine of which were in marble, and seven in bronze. Some of these are from the antique; but the others resemble those seen in the French gardens, laid out in the time of Louis XIV. A fountain was also erected in the centre of the garden; and additional improvements are still being made to this royal domain, which is the finest in England.

CHAPTER III.

POINTS IN A GARDEN; PLAN; SIZE; FORM; WATER-SUPPLY; SITUATION; SOIL; WALLS; SLIPS AND RING-FENCE; SHELTER; HOT-HOUSES; THE MELON-GROUND; DISTRIBUTION OF THE GARDEN AREA.

POINTS IN A GARDEN.

Previous to the planting of a garden, there are various points to which attention should be given, and which will indeed, to a large extent, absolutely determine the manner in which it must be arranged and laid out, in order that its space may be thoroughly utilised, both as regards beauty, and the fruits, vegetables, and flowers with which it is intended to be stored and adorned. The principal of these points comprise Plan, Size, Form, Water-supply, Situation, Soil, Walls, Slips, and Ring-fence; Shelter, Hot-houses, the Melon-ground, and the Distribution of the Area.

PLAN.

Whatever is to be carried out with taste, skill, or enterprise, no matter of what character it may be, the mind should previously form a clear conception upon, at least, its principal features, if for no other purpose than to impart greater vigour to action, and ensure greater certainty of success. It is thus that every general conducts his campaigns. It was thus that Napoleon I. acted previous to his setting out to make his Italian conquests, when he swept the legions of the Austrians before him. He planned and calculated; foresaw, conquered, and entered the capitals of his foes, and even predicted where battles should be fought between the contending forces, and which actually did take place on the very spots, as indicated by black and red-headed pins on the maps of the countries through which he was to lead his armies. Although the designing of a garden is a much more humble effort than the planning of a campaign, still it ought to be considered of sufficient importance to those who are to enjoy its fruits, to induce them to make a draft of its general features in their own minds before they commence to form it. Indeed, everything connected with this part of it should be clearly set down upon paper. "A well-arranged plan," says Mr. C. Mackintosh, "is as necessary in commencing a garden, as in beginning to build a mansion, if unity and system are things worth caring for. The whole of the projected arrangements of a garden should be *laid down on paper*, and submitted to competent examination. The execution of the different parts

may be carried into effect at once, or progressively, according to the wants and wishes of the owner. Thus the walls may be built; artificial shelter planted, if required; the ground drained, levelled, and trenched, so that the fruit trees may be early planted, as it requires some years to bring the majority of them to a fruit-bearing state."

SIZE.

As a matter of course, the size of a garden must be determined by the amount of products desired to be obtained from it, the place in which it is situated, the family it is to supply, and, in some degree, their social position. It should, however, be proportioned to the dwelling to which it is attached, and to the number of inhabitants it does or may contain. This is a judicious rule; yet it is always better to have the garden too large than too small; and it is not considered anomalous for a large garden to be annexed to a small house. It is well known that there are some families who care very little about vegetables; whilst there are others who prefer them to almost every other kind of food. Some will go for weeks together without them, whilst others will not go a day. Accordingly, it may be as well to state, that the quantity of ground to be laid out for a family of four persons, exclusive of servants, should be a rood, provided it be good working, open ground; and the same proportion preserved in calculating for higher numbers. If it be possible, however, to allow more, it should be done, as the over-ground may be allotted for the cultivation of the strawberry in all its varieties; or, if not for this, it may be stocked in such a manner as to secure the family from, at any time, running short of vegetables. It should also be considered that artichokes, asparagus, and a long succession of peas and beans, require a quantity of ground; whilst if cucumbers, melons, &c., are to be raised in any considerable quantity, the hot-beds necessary for them will occupy a good deal of room.

FORM.

Either a square or an oblong is the form most approved of by practical men for a garden. Abercrombie, however, proposed the long octagon form; or, in other words, an oblong with the angles cut off, assigning, as a reason, that it equalised the advantages of aspect between the inner and outer sides of the wall. Hill recommended a geometrical square, "set out in such a manner that each wall may have as much benefit of the sun as possible." Besides these, circular, oval, and irregular figures have been recommended and adopted; but the general opinion is, that the square or oblong form is the most convenient; but every form appears to be admissible. "The oval, polygonal, and trapezium forms have been adopted for the walls of a garden," says Mr. Loudon, "in order to procure a more equal distribution of sun and shade; but the inconveniences attending the culture and management of the compartments of such gardens are considerable. Nor does it appear that an equal distribution of sun is so suitable as that of having some walls as advantageously exposed as possible for the more delicate fruits, and others less so for hardier sorts, and for retarding fruits."

WATER-SUPPLY.

Water is one of the most essential elements in all garden operations. To a kitchen garden it is indispensable; and from whatever source it is supplied, it should be kept either in open cisterns, reservoirs, or in pipes properly protected, in different parts of the garden. It should, also, be handy to the hot-houses. Many kitchen crops are lost, or produced of very inferior quality, from being denied a sufficiency of water. It is from this circumstance that lettuces and cabbages are often hard and stringy; that turnips and radishes do not swell; that onions decay; and that cauliflowers die off. Generally, in dry seasons all the *Cruciferæ* (turnips, cabbages, radishes, &c.) become stunted, or covered with insects, even in rich deep soils. Even the foliage of fruit, as well as other trees, require watering in dry seasons. By dispensing it freely, it destroys and prevents the accumulation of insects, and the fruit of the strawberry-bush, and other fruits, are enlarged by it. "If there be no natural stream that can be conducted through a garden," observes Nicol, "water should be conveyed from the nearest river, lake, or pond; soft water being most desirable for the use of a garden."

SITUATION.

As convenience of situation is one of the first considerations that concerns us in the taking of a house, so ought it to be in making choice of the ground intended for a garden. In making this choice, the bottoms of valleys and all low situations should be avoided. "The greater warmth of low situations," observes Dr. Darwin, "and their being generally better sheltered from the cold north-east winds, and the boisterous south-west winds, are agreeable circumstances; as the north-east winds, in this climate, are the freezing winds; and the south-west winds being more violent, are liable to do much injury to standard fruit trees in summer, by dashing their branches against each other, and thereby bruising or beating off the fruit; but in low situations, the fogs in vernal evenings, by moistening the young shoots of trees, and their early flowers, render them much more liable to the injuries of the frosty nights that succeed them, which they escape in higher situations." Thus, of two evils, choose the least; and Professor Bradley adduces a fact decisive of Dr. Darwin's opinion. A friend of his had two gardens, one not many feet below the other; but so different that the low garden often appeared covered with the evening mists, when none appeared in the upper one; and, in a letter to Bradley, he mentions, that his lower garden is much injured by the vernal frost, though his upper one has escaped. A similar fact is mentioned by Lawrence, who observes that he has often seen the leaves and tender shoots of tall ash trees after thick mists, to be frozen, and, as it were, singed in all the lower parts and middle of the tree; while the upper part, which was above the mist, remained uninjured.

As the selection of ground for a garden is a most important point, we will dwell upon it a little longer, and adduce several other opinions as to situation. Abercrombie says that this should not be so elevated as to be exposed to boisterous and cutting winds; nor should a very low situation be chosen, if circumstances afford any choice: but it should be situated conveniently for access from the house. Nicol and Forsyth agree in preferring a gentle declivity towards the south, a little inclining to the east, to receive the rays of the morning sun. "If it be situated in a bottom, the wind will have the less effect upon it; but then damps and fogs will be very prejudicial to the fruit and other crops. If situated too high, although it will, in a great measure, be free from damps and fogs, it will be exposed to the fury of the winds, to the great hurt of the trees, by breaking their branches, and blowing down their blossoms and fruit." Respecting the situation of the kitchen garden Nicol speaks very strongly. In relation to the house, he considers the most awkward situation for the kitchen garden is to be in its front; especially if placed near, so that it cannot be concealed by some sort of plantation. "Generally speaking," he remarks, "it should be placed in the rear or flank of the house, by which means the lawn may not be broken and rendered unshapely where it is required to be most complete. The necessary traffic with this garden, if placed in front, is always offensive. Descending to the consideration of more humble gardens, circumstances are often so arbitrary, with respect to their situations, as that they cannot be placed so as to please or give satisfaction by their products. There are cases where the kitchen garden is necessarily thrust into a corner, and, perhaps, is shaded by buildings, or by tall trees, from the sun and air; where they are placed on steep slopes, in a northern aspect, the subsoil is a clayey or cankering gravel, and the site cold and bleak. Such situations as these are to be avoided, and may be considered among the worst possible. The next worst are open, unsheltered plains; but even there, if the soil is tolerably good, and the subsoil not particularly bad, shelter may be formed, so that, in a few years, the garden may produce a return for the expense laid out in its improvements."

SOIL.

As a good man may often enhance the respect of a humble office, so may a good soil make a fair garden, even in an indifferent situation. A bad man, however, degrades the best of positions; and a bad soil, let the situation be what it may, will never make a good garden. But it is within the power of

man to change the soil, although he cannot, except to a very limited extent, change the situation. He may cover what is bad with what is good; and, by degrees, so completely metamorphose the surface of the earth, that he will have no difficulty whatever in rearing the best crops upon it. Many of our best gardeners, in days gone by, were sometimes in the habit of sacrificing soil to situation; but this is not now so much the case. Nicol thought that several kinds of soil were necessary in the same garden; and Dr. Neill was of the same opinion. "It is a happy circumstance," says Nicol, "that, in many instances, we meet with different soils in the same acre. In the same garden they should never be wanting; and where nature or natural causes have been deficient, recourse must be had to art, inasmuch as the variety of fruits and vegetables to be cultivated, require different soils to produce them in perfection." Forsyth, in his *Treatise on Fruit Trees*, recommends a deep soil, "of a mellow pliable nature, and of a moderately dry quality; and if the ground should have an uneven surface, by no means attempt to level it; for, by that unevenness, and any little difference there may be in the quality, you will have a greater variety of soil adapted to different crops. The best soil for a garden is a rich mellow loam; and the worst a stiff heavy clay. A light sand is, also, a very unfit soil for a garden."

The soil of a new garden should be from two to three or four feet deep; and, according to Loudon, its varieties should comprise—strong clayey loam, light sandy loam (which are the two grand objects), a composition of one-fourth strong, with three-fourths light, loam; half strong and half light, and one-fourth light, and three-fourths strong. These, he says, by a proper treatment, and with the proper application of manures, may be rendered productive of any of the known and commonly cultivated vegetables in the highest degree of perfection. In selecting a piece of ground for a garden, it is not a bad plan to take for our guide the natural herbage with which it may be covered. Neill recommends this. He observes—"The plants growing naturally on the surface should be noted; as, from these, a pretty correct opinion may be formed of the qualities of the soil. The subsoil should also be examined. If this be radically bad, such as an iron tilth mixed with gravel, no drawing, trenching, or manuring will ever prove an effectual remedy; if, on the contrary, the subsoil be tolerably good, the surface may be greatly meliorated by these means. In every garden, two varieties of soil are wanted—a strong and a light one; or, in other words, a clayey loam and a sandy loam; different plants requiring these respective kinds. For the general soil, a loam of middling quality, but partaking rather of the sandy than the clayey, is accounted the best." Loudon recommends these qualities of soil:—a strong loam, a light loam, and a loam of medium quality; the latter occupying the borders, and about half of the compartments.

WALLS.

Walls with a south aspect have always been considered the best for growing fruits; and the approved height is from ten to twelve feet; but this is a circumstance usually decided by the form and size of the garden. With respect to the height of fruit-walls, considered merely as such, Nicol gives the preference to twelve feet; that height being very convenient for pruning, watering, and gathering the fruit. It also admits of a sufficient expansion for the branches of most trees. A small garden encompassed by high walls, has a bad effect, and presents a gloomy appearance; but if they be of different heights they give relief to the view. In a garden of an acre, for example, forming a parallelogram of the best proportion, and gently elevated, the north wall may be raised to the height of fourteen feet; the east and west walls to twelve feet; and the south wall to ten feet above the ground-level. Although walls are erected round a garden chiefly for the purpose of rearing fruit against them, still they have another advantage.—A kitchen garden may be as perfectly fenced and sheltered by hedges as by walls, which was the case in former times. But in order to obtain the finer fruits, it becomes necessary to build walls, or to erect pales as substitutes. The influence which walls have in increasing the temperature of the air immediately in contact with them, is estimated at 7° of south latitude. The mean temperature of a south wall, or within a few inches

of one, is equal to the mean temperature in the open plain of 7° further south. Hence it is that grapes, which ripen in the open air at Bordeaux, require a south wall in the vicinity of London, which is 7° further north.

The best materials for building the walls of a garden are pronounced to be bricks; and where these cannot be got, it is better, Forsyth says, to dispense with walls altogether, or to adopt wooden ones. Nicol is of the same opinion, although he considers stone best for the foundation and basement. Bricks are warmer and better for training trees upon than stone. It is, therefore, recommended that the south, east, and west aspects, should either be entirely composed of bricks, or faced with them. If the wall be entirely constructed of, or backed with stone, though faced with bricks, and trees are to be trained against such backings, the stones should be laid in regular courses of from four to seven or eight inches thick, and be each fifteen or twenty inches long, in order that there may be a frequency of joints, and that the trees may be properly trained against the wall. Dark-coloured whinstone (greenstone or basalt) is, after bricks, the next best material; and the nearer it approaches to black, the higher does it rise in value. Walls having south, south-west, or south-east aspects, against which apricots, figs, nectarines, peaches, and the finer kinds of pears and plums are grown, should be built with this stone, provided bricks cannot be obtained. The basement of the wall, however, should always be built of durable stone.

SLIPS AND RING-FENCE.

There are few who have walked into the country, and still fewer, we presume, whose usual abode is in the country, who have not observed that there is generally round the walls of large gardens a fence consisting of a hedge of some sort—a paling or a low wall, or sunk fence, placed at some distance from what may be called the inner or principal wall, by which the garden is surrounded. This is technically designated the *Ring-fence*, and the intervening space between it and the principal wall, is denominated the *Slip*. One of the objects of this arrangement is to enable both sides of the main wall to be brought into use if necessary; another is, to obtain an additional portion of garden-ground; and another is, to serve, in some degree, as a protection to the principal garden. The slip, according to McPhail, and most authors, should not be narrower than thirty feet; neither should it be so wide as to throw the plantation for shelter too far off. According to Nicol, the breadth should be, at least, twenty feet, in order to afford a sufficient border for the trees and a walk. It may, however, be increased in breadth to such an extent as to allow ground without the space, enclosed by the principal walls, for the supply of the family; and it may be enlarged on all sides, or any particular side, for that purpose. In addition to these opinions, Forsyth states, that the garden should be surrounded with a slip from forty to sixty feet wide, or more; and this, again, enclosed with an oak paling from six to eight feet high, with a *cheval-de-frize* at top, for the sake of additional protection, as well as of giving more strength to the paling. By making slips on the outside of the garden wall, ground, upon which gooseberries, strawberries, and currants may be grown, is obtained; and that part of the slip lying nearest to the stables (if well sheltered, and, at the same time, exposed to the sun), may be laid out in melon and cucumber beds; whilst, as has already been stated, both sides of the principal garden wall may be occupied by fruit trees.

SHELTER.

Shelter from the inclemency of the seasons is as necessary to the infancy or blossoming of the vegetable, as it is to that of the animal world; and horticulturists concur in the opinion that a garden should be especially sheltered from the east, north, and west winds. McPhail says that this should be done by hills, rising grounds, high buildings, or plantations of trees, and at such distances, on the east and west sides, as not to intercept the rays of the sun. Nicol is of opinion, that the kitchen garden should be sheltered by plantations; but should by no means be shaded or crowded by them. If walled round, it should be open and free on all sides; or, at least, to the south-east and west, that the walls may be clothed with fruit trees on both

sides. Some years ago, the following calculations, respecting the prevalence of certain winds, were made by the Royal Society of London; and are worthy the consideration of those engaged in horticultural, as well as even agricultural pursuits. In England, the following are the number of days from which the winds specified blow:—

South-west	112	days.
North-east	58	„
North-west	50	„
North	16	„
South	18	„
West	53	„
East	26	„
South-east	32	„
	365	

Westerly winds seem to prevail most in the months of July and August; north-east during those of January, March, April, May, and June; north-west from November till March. The north-east wind is less frequent during February, July, September, and December; and the north-west less frequent during September and October, than in any other months.

As similar calculations have been made in the neighbourhood of Glasgow, the following table may serve for the west of Scotland:—

North-east	104	days.
North-west	40	„
South-east	47	„
South-west	174	„
	365	

In Ireland, the prevailing winds are the west and south-west.

Whilst these tables may assist in enabling us to determine the quarters in which the garden requires the greatest shelter or protection, we may observe that this may not unfrequently be derived even from the natural shape and situation of the ground. It is observed by Neill, that gentle declivities at the bases of the south or south-west sides of hills, or the sloping banks of winding rivers with a similar exposure, are very desirable. If plantations exist in the neighbourhood of the house, or of the site intended for the house, the designer of a garden naturally turns his eye upon them as the means of his principal shelter. He takes care, however, that his ground shall be chosen at such a distance from them as will prevent his fruits from being shaded by them. If the plantations be young, and contain beech, elm, oak, and other tall-growing trees, allowance, as a matter of course, is made for this in the measurement of the distance. It is a rule, however, that there should be no tall trees on the south of a garden, except at a considerable distance. This has been suggested from the fact, that during winter and early spring, they fling their long shadows into the garden at a time when every sunbeam is a welcome visitor. On the east, also, they must be sufficiently removed to admit the orient beams of the early morn; but on the west, and more particularly on the north, trees may be suffered to be nearer—say, perhaps, within about a hundred feet—and they may be more clustered.

HOT-HOUSES.

It is frequently a matter of choice as to where the hot-houses shall be placed in a kitchen garden; but in extensive establishments, a whole garden, or walled enclosure, is sometimes entirely devoted to the cultivation of the products belonging to this department of horticulture. This is the case both at Kew and at Frogmore; but in places of more moderate dimensions, the hot-houses either find a position against the north wall of the garden, or against some of the cross-walls, which, here and there, partially intersect its area. Occasionally they are placed in the *slip*, which has greater width accorded to it for that purpose, either on the east or west sides of the garden, or on the north, where there may chance to be a favourable declination of the ground. It is the opinion of Mr. Loudon, however, that their effect is always best when they are situated within the boundaries of the garden proper, either attached to, or on, the north of the cross-walls. "In this way they are sources of greater interest to the proprietor, and come more naturally into the general course of promenade than by any other arrangement; for it must not be forgotten that the pleasure or satisfaction derived from even culinary hot-houses, does

not wholly consist in being put in possession of certain fruits of excellent quality (for, if so, recourse need only be had to public markets), but in marking the progress of the trees or plants on which these fruits are grown in all their different stages; and, as Nicol observes, in being able to say—*These are the products of my own garden.*"

It is advisable not to mix culinary hot-houses with such as are erected for the rearing of ornamental plants. This is the case in some old-fashioned places which, like the customs of the East, have been handed down from father to son, as if they had been stereotyped from time immemorial. This, however, should not now be the case, if there be space enough for a different arrangement. In the old plans alluded to, the green-house, the plant-stove, or botanical hot-houses, were attached to those in which the culinary products were reared, without any considerations of taste, or suitableness whatever, entering into the minds of their owners. In some instances it was a work of necessity, and may still be in moderately-sized gardens; but where variety and effect are taken into the calculation, "the ornamental or curious productions of gardening will be kept separate from those whose beauty consists entirely or chiefly in their utility. In this way two distinct and strongly marked characters are produced, instead of scenery of a mixed and, as it were, neutralised character."

THE MELON-GROUND.

It is a practice pretty well established to place the melon-ground in the *slip*. Where the range of the hot-houses occupies the north wall, with such a degree of slope, or declivity, as will shorten the shadow of this wall in winter, when the sun is low, the melon-ground may then most appropriately be placed in what may be designated a bay of the slip behind the north wall. Mr. Forsyth, as he usually does, gives reasons for assigning a portion of the outside slip next the stable to hot-beds for raising melons and cucumbers. These are, first, because there will be no litter to carry within the walls to dirty the walks; secondly, the beds will not be seen from the garden; and, thirdly, there will be a convenience in carrying the dung, by which a great deal of time will be saved in carting and wheeling. It will be necessary, especially in exposed situations, he says, to enclose the melon-ground with either a wall or paling, from six to eight feet high. It was formerly a practice to enclose melon-grounds with reed-fences; but although these are tolerably warm, and are easily removed from one place to another, being made in separate panels, they are very apt to harbour vermin. It will certainly be found the most convenient plan to have the mould and compost-ground as near to the melon-ground as possible: and if placed between the pits and the hot-beds, it will be all the better. This is Loudon's opinion; so that when the melon-ground is placed in the bay behind the north wall, the compost-ground will occupy a space which would otherwise be too much shaded for hot-beds or pits.

DISTRIBUTION OF THE GARDEN AREA.

The most propitious seasons for forming or laying out a garden are those of the spring and summer; but at whatever period the operations are commenced, they should be disposed in such a manner as to enable them to be finished early in autumn, in order to admit of the planting of fruit trees, and the laying nicely the edges of the walks. When we have resolved to make a garden, the distribution of its several compartments is necessarily one of the primary considerations. In this we must, in a great measure, be guided by the form and size which we have determined to make it. "The best figure," says Forsyth, "is a square, or oblong, where the garden itself is of either of these forms; but if not, they may be laid out in any other figure that is thought to be most convenient." In some of our best gardens, the compartments are laid out in beds four feet wide, with narrow alleys. These alleys, however, occupy a large space, and are, therefore, not to be recommended for a small garden. Mr. Neill thinks that their "advantages of convenience and neatness, in enabling the workmen to clean and gather the crops without trampling the ground, seem to compensate for the sacrifice of space." For currant, gooseberry, or raspberry bushes, the compartments remain undivided; whilst for large perennial plants,

such as rhubarb and artichokes, narrow beds are not requisite.

In reference to the laying out of borders, it is recommended by Abercrombie, that those next the walls should be composed of prepared soil of from eight to twelve feet wide, and the same description of soil extended under the walks, in order to allow a liberal width for the roots to spread without impediment. Next to the borders a space should be left for a walk entirely round the garden, of from four to six feet wide. Some persons fancy a border on the inward side of the walk, for the cultivation of espaliers and esculents of small growth; whilst others divide the central parts, at once, into main compartments or divisions. In regulating the walks or alleys, convenience of access is the principal object to be attended to; and when the ground is large, its centre should be traversed by a walk, with parallel borders, from which cross-walks may be made to ramify, if necessary. It must be remembered that it is not enough to provide good surface soil for fruit-tree borders. In addition to this, the ground must be thoroughly drained, and the roots must not be permitted to penetrate the subsoil, but be kept within a few inches of the surface of the ground, that they may draw their nourishment from the upper soil. Respecting the most congenial soil for the nurture of fruit trees, we find an intelligent writer in the *Gardener's Chronicle*, observing, that the soil, in the most productive part of Kent, is locally called hassock, or stone-shatter. The surface of this is a mixture of sandy loam, largely intermixed with small pieces of light-coloured Kentish rag-stone, and is from six inches to two feet deep on solid stone rock. In this soil, "fruit trees of all sorts flourish and produce abundantly; even peach and pear trees, of the most delicate kinds, grow with the greatest luxuriance, and are free from disease. To what are we to attribute this result? Fruit trees growing in the kind of soil just described produce short-jointed wood; when the roots are stimulated by rich manures, rampant luxuriant branches are produced; when they descend to a distance beyond the genial influences of the atmosphere, they absorb a large quantity of water, which the leaves are unable to get rid of by perspiration, and the inevitable result is green canker, and a whole host of diseases. Such trees continue to grow to a late period of the autumn, when the lowness of the temperature, and the absence of sunlight, render it impossible for them to give off their superabundant water by perspiration, the only means by which all trees and plants are enabled to part with it." On the other side of the question we find it stated, that trees in the stone-shatter soil, "grow slowly; their tissues become perfectly organised as they proceed, and are not liable to be acted upon by accumulated moisture. As the days become short, and the power of the sun declines, the motion of the fluids and the action of the cells gradually cease, when the whole system is in unison with the course of nature; in winter the roots are almost dormant, the branches are short-jointed, and well-ripened, and all are prepared to withstand the severity of the weather, and to awaken in spring, full of life and blossom."

In laying out the area of the garden, the principal points demanding attention are clearly enumerated by Mr. Loudon, in the following passage, with which we will conclude this part of our subject. "The area, or space enclosed by the garden walls, is usually formed into compartments, very commonly called quarters and borders, or narrow slips, running parallel to the walls and walks. The magnitude and number, both of compartments and borders, as well as of the walks, depend on the size of the garden, and partly, also, on the taste of the designer. Rectangular figures are almost universally preferred to both. The breadth of wall-borders ought, generally, to be the same as the height of the accompanying wall; the borders may be broader, but do not produce a good effect when narrower. In a garden of an acre within the walls, the walks are never less than six feet broad, the surrounding or wall-border from ten to fifteen feet, and the marginal borders from seven to eight feet wide. In the latter an espalier rail is frequently fixed about five feet from the edging of the wall; in other cases the trees are planted along the middle of the border, and trained as dwarfs; an alley, or a path, commonly two feet wide, separates the borders from the compartments. In the slip may be formed irregular compartments, or borders,

the gardener's house, and the compost and melon-ground. The fence on the south side may be an open railing, and on the north a wall or close holly-edge, the whole surrounded by a plantation near or more distant, according to circumstances. The hot-houses being placed against the north wall, behind them are placed the sheds; and, on a moderate scale, these may contain a working-room, fruit, and seed-room, tool-houses, and the furnaces. To the open space behind, for composts and hot-beds, there should always be a carriage entrance for bringing in earth, fuel, dung, &c. In the centre of the garden, may be a fountain, or basin of water; and in the gardener's house an upper bed-room to overlook the whole. In smaller gardens the same general plan is adopted, as far as their extent admits. To combine ornament with use, the standard fruit trees and shrubs may be planted in borders accompanying the walks; but where economy of ground is the object, the trees and shrubs may be collected together in compartments, and borders altogether omitted."

CHAPTER IV.

VEGETABLE STRUCTURES; PROPAGATING BY SEEDS; BY BULBS, SUCKERS, AND RUNNERS; BY SLIPS AND OFFSETS; BY LAYERS; BY BUDDING AND GRAFTING; BY IN-ARCHING AND CUTTINGS; BY SINGLE LEAVES.

VEGETABLE STRUCTURES.

In considering the microscopic portion of the vegetable structure, we find that its elementary tissues are few and simple. They consist of organs, to which the designation of *cells* and *vessels* has been given; the former taking the shape of minute bladders or vesicles, varying in size and form; and, united together, constituting what is called a cellular tissue. The latter are closed tubes of an elongated form, often tapering to each end, and, when combined, constituting *vascular tissue.* The distinction between *cells* and *vessels* is based on their comparative length; but occasionally, cells become lengthened so as not to differ from vessels in that respect. This is the case with some veins, and also with the filamentous or thread-like tissue of fungi. Where such long cells exist, they are briefly characterised by the thin and delicate nature of their texture. The first form of the elementary organs of plants is a closed spherical or elongated vesicle, its walls being composed of a membrane, in which a fluid is contained. If, after its development, it still continue closed, it then receives the name of *cell;* but if a row of vesicles, arranged in lines, become united in the course of development, so as to form a tube with an uninterrupted cavity, by absorption of the cross walls, then what has received the name of a *vessel* is produced. "On making a transverse section of a succulent stalk," says a modern scientific writer on Botany, "such as that of rhubarb, or of a cucumber or melon, we perceive, by the aid of a glass, circumscribed angular meshes and rounded openings; and, in a longitudinal section of the same stalk, similar meshes are also seen, with long tubes of various kinds. The membrane, forming the walls of both cells and vessels, is composed of a substance called *cellulose*, in many respects resembling starch, but differing in giving a yellow in place of a blue colour with iodine. The membrane has, in general, no visible pores or perforations, but fluid matters pass through it easily. Some plants—such as sea-weeds, mushrooms, and lichens—consist of cellular tissue alone, and hence are called Cellular plants; while others—such as ordinary flowering plants—consist of cells and vessels combined, and receive the name of Vascular plants."

PROPAGATING BY SEEDS.

Among the most curious, as well as difficult,

operations of gardening, is the propagation of plants. This is universally done by seed; but also, to some extent, by germs or bulbs, suckers, runners, slips, and offsets. Artificially, it is done by layers, budding, grafting, inarching cuttings, and single leaves. It is a general rule that imported seeds should be sown as soon as possible after their reception, except in the case of such as speedily vegetate, which, however, should not be put into the ground either late in the autumn, or early in the winter. The reason for this advice is, that if they vegetated during the dark months of the year, the probability is that the young plants would be cut off. Hard seeds, and such as have no tendency to rapid vegetation, may be sown at those seasons when it is calculated that their growth will commence. A primary object, however, as regards all seeds, is to be sure that they have the principles of life in them; for some are deprived of their vitality very early after they are gathered, while others retain it only for one, or perhaps a couple of seasons. Another consideration of some importance, is the size of the seeds, as on this depends the depth to which they require to be covered with the soil. For the same reason, the texture of their own covering must be attended to. Mr. Loudon tells us, that on the form and surface of the outer coating of seeds, sometimes depends the mode of sowing, as in the carrot; and on their qualities in general, depends their liability to be attacked by insects. The germination of the seed, likewise, greatly depends on the presence of moisture, and a due amount of heat and air in the soil. No seed will sprout or germinate at 32° Fahr., nor if enclosed in hermetically sealed vessels, nor even if too deeply buried in the earth. Such are the points to be kept in remembrance in propagating by seed; whilst the nature of the climate, the soil, and the season, must assist in determining how, where, when, and in what quantity, the seed should be sown.

PROPAGATING BY BULBS, SUCKERS, AND RUNNERS

Whether the bulb be cauline—that is, growing immediately on the herbaceous stem or stalk—or radical, it generally requires to be planted very soon after it has been removed from the parent plant. It should, also, be put into light earth, and buried no deeper than about the depth of its own diameter from the surface. Bulbs which have attained to maturity, may be preserved for several months out of the soil, without their powers of vitality suffering in any degree; but infant bulbs cannot bear treatment of this kind. If withheld from the soil, they soon dry up, and become seriously injured, if, indeed, they do not entirely lose their vitality. *Suckers* have been described as mere runners under-ground; and propagation by them is seldom adopted, unless it be in the case of some hardy shrubs, and the pine-apple. Plants raised by these means, among the former, however, are usually held to be of inferior quality; but in the case of the pine-apple it is otherwise. Where a system of good culture is pursued, an abundant stock is easily maintained to meet the necessities of a private supply, by making choice of the strongest suckers produced on the stem. The redundancy of these, of course, depends, more or less, on the amount of check which the plant may have sustained by the formation of the fruit. Rare sorts may be vastly increased by retaining the stump instead of throwing it away, which is usually done after the fruit has ripened, and placing it in a damp pit, with a bottom temperature of 90°. Every latent eye should then sprout, and a large quantity of young plants be the result. Loudon, in speaking of propagating by suckers, says, all that is necessary to be done is to dig them up, and to cut off each plantlet with a portion of root; after which its top may be reduced, by cutting off from one-fourth to one-half of the shoot, in order to fit it to the curtailed root; and it may then be planted either in the nursing department, or, if a strong plant, where it is finally to remain. Propagating by *runners* is, with a certain species, both convenient and certain. All that is necessary to be done, is to allow the plantlet on the shoot, or runner, to be well rooted before being separated from the parent. It may then be planted in the spot where it has been determined it shall remain.

PROPAGATING BY SLIPS AND OFFSETS.

A slip is a shoot which springs from the

upper part of the roots of herbaceous plants, and may be readily seen in the auricula, or in under-shrubs, as the thyme. When the lower part, from which the roots proceed, has acquired a comparatively firm texture, or begun to ripen, the shoot sought is to be slipped or drawn from the parent plant, so far as to take with it a claw of the old wood stem, or root. As this claw is usually ragged in its edges, it is to be made smooth by means of a sharp knife, and the slip then planted in a congenial soil. It should be kept in shade until it strikes root afresh, or appears to have recovered from the effects of its separation from the parent plant. Propagating by offsets is, strictly speaking, applicable only to young radical bulbs, which, when taken from the parent roots, are only termed offsets.

PROPAGATING BY LAYERS.

A layer is a branch bent into the earth, and half cut through at the bend, the free portion of the wound being called *a tongue*. It is, n fact, a cutting only partially separated from its parent. Dr. Lindley, in his celebrated work on the *Theory and Practice of Horticulture*, informs us, that the object of the gardener is to induce the layer to send forth roots into the earth at the tongue. "With this view he twists the shoot half round, so as to injure the wood vessels; he heads it back so that only a bud or two appears above ground; and, when much nicety is requisite, he places a handful of silver sand round the tongued part; then, pressing the earth down, so as to secure the layer, he leaves it without further care. The intention of both tongueing and twisting is, to prevent the return of sap from the layer into the main stem, while a small quantity is allowed to rise out of the latter into the former; the effect of this being to compel the returning sap to organise itself externally as roots, instead of passing downwards below the bark as wood. The bending back is to assist in this object, by preventing the expenditure of sap in the formation, or rather completion, of leaves; and the silver sand is to secure the drainage so necessary to cuttings." Layering is practised in the case of roses and other shrubs, which do not strike so readily by cuttings. It is a matter of no importance as to how the layering is effected. It may, therefore, be varied according to circumstances.

PROPAGATING BY BUDDING AND GRAFTING.

These operations, says Dr. Lindley, consist in causing an eye or a cutting of one plant to grow upon some other plant, so that the two, by forming an organic union, become a new and compound individual. The eye, in these cases, takes the name of bud; the cutting is called a scion; and the plant, upon which they are made to grow, is named a stock. Propagation by eyes and cuttings is, therefore, the same as budding and grafting, with this important difference—that, in the one case, the fragments of a plant are made to strike root into the organic soil, and to grow on their own bottom, as the saying is; while, in the other, they adhere permanently to living organic matter. In like manner, the operation of in-arching, or causing the branch of one plant to remain attached to its parent, and, at the same time, to grow upon the branch of another tree, is analogous to layering.

The object of these operations is to effect many purposes. Plants, such as the apple and the pear, will bud or graft easily; but they are both difficult to strike from cuttings. There are many other plants of a similar constitution. It would appear, that the species which are naturally delicate, become strong when grafted on robust stocks. The result of this is a greater abundance of fruits and flowers. "Thus, the more delicate kinds of vines produce larger and finer grapes when worked upon such vigorous sorts as the Syrian and Nice. The double yellow rose, which so seldom opens its flowers, and which will not grow at all in many situations, is said to blossom abundantly, and grow freely, when worked upon the common China rose. One plant may be made to bear a different variety upon every branch, as has been seen with pelargoniums, fuchsias, and cacti. The peculiar qualities of some plants can only be preserved by working. This is especially the case with certain kinds of variegated roses, which retain their gay markings when budded, but become plain if left to their own modes

of growing. Fruit may be obtained from seedling plants by these processes much earlier than by any others: the quality of seedling fruit trees may be ascertained in two or three years, instead of twenty or thirty; and thus long and objectless expectation may be avoided." It has been ascertained, by Mr. Knight, that it is within the reach of possibility to transfer the blossom-buds of one plant to another, so as to obtain flowers or fruit from them immediately. He thus fixed on the wild rose the flower-buds of garden roses; and these buds being plentifully supplied with nourishment, produced much finer roses than they would have done had they been permitted to retain their natural situation. He repeated many similar experiments upon the pear and peach tree, with equal success; but in the case of the pear, he discovered, that if the buds were inserted earlier than the end of August, or the beginning of September, they became branches and flowers.

The modes in which these manipulations were performed, were both numerous and various; and the whole theory was fully explained by De Candolle, in his *Vegetable Physiology;* by D'Albret; also by Knight, and others. The most valuable information on the subject, however, is to be obtained in Dr. Lindley's *Theory of Horticulture*, from which we have already quoted, and which is one of the best works on this subject in the language. As the parent possesses considerable influence over the scion, great care should be taken in making the selection. If nothing more than the increase of individuals was to be expected from the operations of budding and grafting, then the stocks most readily obtained, if of a relationship near enough to the scion or bud, would be the most suitable. But this is only of secondary importance. What is of far higher moment, is the fact that the operation ennobles the tree, by metamorphosing its character to an improved condition, whether as regards its flowers or fruits. To a certain extent, it hardens a tender sort when worked on a stock more capable of enduring cold, or one which is better adapted to the low-soil temperature of northern latitudes, than such as may be natural to the tree from which the bud or scion is taken. This fact is denied by Mr. Knight; but it is maintained by Dr. Lindley. In his *Theory of Horticulture* he says—"Probably in Persia, the native country of the peach, that species, or its wild type the almond, is the best stock for the former fruit; because the temperature of the earth is that in which it was created to grow. But in a climate like that of England, the summer temperature of whose soil is so much lower than that of Persia, the plum, on which the peach takes freely, is a hardy native, and suited to such soil; and its roots are aroused from their winter sleep by an amount of warmth insufficient for the peach. Experience, in this case, completely confirms what theory teaches; for although there may be a few healthy trees in this country, growing upon the almond stock, it is certain that the greater part of those which have been planted have failed; while, in the warm soil of France and Italy, it is the stock upon which the old trees have, in almost all cases, budded."

That budding and grafting may be practised with greater certainty of success, a soil suitable to the nature of the stock should be carefully chosen. Thus experiment has proved that, in loamy soils, the apple succeeds best on the Doncin stock; and in chalky soils, the crab. The pear thrives best in a loamy soil, or in light soils enriched with decayed vegetable matter, when grafted on the quince; but on light chalky soils the wild pear is preferable. The plum succeeds best on loamy soils; when worked on the plum stock; but it does better on the almond, if in chalky or light soils. The cherry thrives best in loamy, or in light rich soils, when worked on the wild cherry; and in chalk when on the mahaleb stock. In horticulture, as in every other science, one condition influences another. Thus, the stock considerably affects the fruit as well as the strength of the scion. This has been proved in the case of the Stanwick nectarine, which has a great tendency to crack rather than ripen in the ordinary way. We are informed that this tendency can be cured by being first budded on a very strong magnum bonum plum, about a foot high from the ground. The quality of the fruit is, in general, also improved by growing the plant in this manner.

Budding has been defined as consisting in

introducing a bud of one tree with a portion of bark adhering to it, below the bark of another tree. In order to accomplish this, a longitudinal incision is made through the bark of the stock down to the wood; and is then, at the upper end, crossed by a similar cut, so that the marks made bear a resemblance to the letter T. The bud, with a portion of the bark, is then pared off from the scion, and the back portion pushed below the bark of the stock, until the bud is actually resting on the naked wood of the stock. The upper lips of the incision in the stock, as well as in the bud, are made to fit each other, when the whole is fastened down by a ligature of bast applied wet, narrow tape, adhesive straps, or white or green worsted, which completes the operation. The bud should be inserted either when the vegetation of a plant is languid, or the growth above the place of insertion should be arrested by pinching the terminal bud. If this be not done, the sap, which should be impelled into the bud, in order to aid in the process of adhesion, passes on to other parts, and the bud is literally starved to death. For similar reasons, when a bud has firmly fixed itself upon a stock, and began to grow, the stock should be headed back nearly as far as the bud, with the view of forcing all the ascending current of sap to flow towards it. It is necessary that this should be done; for, if not, the buds of the stock itself will receive the nourishment which ought, more properly, to be given to the stranger.

In the operations of grafting, there are also some very essential points to be attended to. Dr. Lindley says, it is always found that a union between the scion and the stock occurs most readily when the latter is headed down: but as he is here thoroughly practical, we will take the liberty of quoting his own words. "The scion," he says, "should always be so prepared that a bud is near the point of union between itself and the stock; because, such a bud, as soon as it begins to grow, assists in the formation of wood, and, also, in binding the two together. The scion should be more backward in its vegetation than the stock, because it will then be less excitable; otherwise its buds may begin to grow before a fitting communication is established between the stock and scion, and the latter will be exhausted by its own vigour. If, on the contrary, the stock is in a state of incipient growth, and the scion torpid, cellular granulations will have time to form and unite the wound; and the scion will become distended with sap forced into it from the stock, and thus be able to keep its buds alive when they begin to shoot into branches. In order to assist in this part of the operation, a 'heel' is sometimes, in difficult cases, left on a scion, and inserted into a vessel of water, until the union has taken place; or, for the same purpose, the scion is bound round with loose string, or linen, with one end steeped in water, so as to secure a supply of water to the scion by the capillary attraction of such a bandage. Indeed, the ordinary practice of surrounding the scion and stock at the point of contact with a mass of grafting clay, is intended for the same purpose; that is to say, to prevent evaporation from the surface of the scion, and to afford a small supply of moisture; and hence, among other things, the superiority of clay over the plaisters, mastics, and cements occasionally employed, which simply arrest perspiration, and can never assist in communicating aqueous food to the scion."

In concluding our remarks upon this portion of our subject, we give the following recipes, from Dr. Lindley's work, for making grafting-wax:—1. Bees'-wax and tallow, equal parts, laid on warm with a painter's brush. 2. Four proportions by weight of pitch, four of resin, two of bees'-wax, one of hog's lard, and one of turpentine, melted and well mixed. When this, or some similar composition, is spread on brown paper, it forms grafting-paper, as it is sometimes termed, which, being cut into slips, can easily be applied.—Another substitute for grafting-clay is sheet india-rubber, cut into narrow strips or bandages, from one-half to three-quarters of an inch broad. The india-rubber is said to possess all the requisites sought for in clay. It is air-tight and water-tight, and will not fall away; it is, also, elastic, which admits of the swelling of the scion in its growth; and it is applied with great ease and rapidity. After wrapping the bandage round the graft and stock, as a linen bandage is applied to a cut finger, the last turn only requires securing, by tying with a piece of thread or thin bast.

PROPAGATING BY IN-ARCHING AND CUTTINGS.

In-arching is supposed to have been the most ancient kind of grafting, as it naturally and by accident takes place in forests. The point in which it stands distinct from grafting, is found in the scion not being cut or separated from the parent, but remains attached to it, until it becomes part and parcel of the stock to which it is tied and adapted in a variety of ways. The scion and stock are, accordingly, mutually independent of each other, the former subsisting on its own resources until a complete union takes place between them. Professor Thowine enumerates no less than thirty-seven varieties of this mode of propagation. Practical gardeners, however, reduce these to two, which are thus defined by Mr. Mackintosh:—*Crown in-arching*, which consists of cutting off the head at the time of operating; *side in-arching*, which retains the head for a certain time. For performing these operations, generally, the spring is the proper season; but any season when the sap is in suitable condition, as it may be in hot-houses, will serve for the purpose. The effect of in-arching is the same as that of grafting, by inducing an earlier disposition to the bearing of fruit. It may, likewise, be applied to plants which may be difficult to propagate by other means. In order that in-arching may be the more certainly accomplished, Mr. Mackintosh says, that "it is necessary that the plants, both the stock and scion, should be either growing near to each other, or, if in a portable state, placed so that their branches may meet. A portion of the bark is then removed from each at the intended point of union—say from one inch to three inches in length, according to the size and strength of the subjects. These parts are fitted together so that the inner barks of both coincide; and the process of tying and claying, or mixing, follows, as in common grafting. Some, however, tongue the scion and stock in the same manner as is done in tongue-grafting. In either way, the cambium shortly becomes developed; the alburnum of the scion and stock becomes united; and when this is accomplished the scion may be cut off, a little below where it is united to the stock, either at one operation, or only partially cut through first, and, in a few days, completely severed. A week or two after the union has taken place, the remaining portion of the scion, if any is left on, when separated from the parent plant, should be cut off close to the stock, that the wound may heal over, and leave the stem as perfect as possible. *Side in-arching* without tonguing is well adapted for young shoots of camelias, oranges, &c.; and when the wood of both scion and stock is soft and full of sap, a union speedily takes place. *Tongue in-arching* is useful when both or either stock or scion are more fully matured, and are somewhat hard and dry."

Propagation by cuttings is, with the exception of grafting, by far the most common of all the modes of artificial plant culture, and depends upon its success from the circumstance of the cuttings themselves bearing leaf-buds or eyes upon their surface. In so far as physiological science can explain the operation of propagation by cuttings, Dr. Lindley states, that "it appears that roots are formed by the action of leaves; that branches are developed from the buds; and that the buds are maintained by the suitable aliment stored up in the stem. Everything beyond this seems to be connected with specific constitutional powers, of which science can give no explanation." The earth in which cuttings strike most readily is thus practically described by Dr. Neuman:—"Different sorts of trees do not root equally well in all soils. There are some cuttings which can scarcely be made to succeed in saline earth, while others succeed in it very well. The soils considered the best for striking cuttings in the open air, are those which are free, sandy, and soft to the touch. *Tamarix elegans*, and *T. Germanica*, prosper in a soil rich in saltpetre; but the Gingko and Poplars cannot strike in it. Cuttings made in glass-houses generally require to be planted in earth mixed with peat in preference to any other, but varied according to the nature of the plant. Whatever composition is used, we must take care not to employ it too dry, or too moist: in the first case, the earth not being able to sustain itself in a convenient manner around the cutting, the latter falls or is displaced when we wish to water it; in the second case, the earth being too compact, it

hinders the formation of roots. Nature makes vain efforts, and the cutting suffers, decays, and dies, in spite of its disposition to vegetate."

It is a rule with all practical gardeners, that the root end of a cutting should be close between a leaf-bud. Every one, however, seems to have a mode of his own in managing cuttings; and as the whole are too numerous to describe, we give the following by Professor Delacroix. "My cutting," he says, "is placed entirely under-ground, so as to form a subterranean curve, of which the convexity is uppermost, the very middle of the curve being on a level with the surface of the soil. At this middle point there must be a good eye, or a small shoot. In this way the whole length of the cutting is protected by earth, and the smaller end, instead of becoming the seat of dryness, which is always more or less injurious, becomes a passage for absorption. The bud, which, under these circumstances, is the only part exposed to the air, bears, without injury, or rather, with advantage, all the causes of excitement."—"Although I did not commence my experiments before the end of June," says a writer on this subject, "I have seen quite enough to satisfy me that the method may be of serious advantage. Two drills, about three inches apart, were drawn parallel with each other, in a kitchen garden of indifferent quality, situated on a calcareous plain near Besançon. A hundred cuttings of apples, pears, plums, apricots, tulip-trees, roses, &c., almost all of one year's wood, were bent and buried in the manner described, with their ends in the two drills. They were watered a few times; and, at this moment, every cutting in the open air, and exposed to the full sunshine, is just as fresh as it was when planted. In most of them, the part exposed to the air (the bud) is the seat of active vegetation, especially in the pear and tulip trees, the buds of which have already made some progress."

When the means at command of the propagator are limited, there is a method of striking cuttings in vials of water. A writer in the *Gardener's Chronicle*, thus describes his practice:—"I tie vial-bottles together by the necks, and hang them in the windows of our small greenhouse, having filled them with clean soft water. I then put in slips of salvia, calceolaria, mimulus, myrtle, or anything I wish to propagate of the same description of plants. In about two or three weeks, or a month, the little silver-like roots appear; and in a week or ten days I plant them in small pots well watered. They never seem to flag or mind the change, and I rarely lose a slip. Myrtles are longer in forming roots; cuttings from the same plant have varied from six weeks to twelve months. They were planted in November. A string of bottles I also hang against the back of the greenhouse, where they have plenty of light; and they do equally well, although not quite so quickly." This practice is old, and well adapted to soft-wooded plants; but even some of the hard-wooded kinds, such as azalias, will strike freely with this treatment.

Light has a great effect on the colouring matter of some plants. Ducaisne found that, in the madder plant, when the lower parts of it were enclosed in cases, glazed at the side with transparent green, red, or yellow glass, the leaves and stem of the part surrounded by red glass became pallid, and exhibited signs of suffering in a greater degree than under the other colours; but all were more or less affected.

PROPAGATING BY SINGLE LEAVES.

Some plants possess the peculiarity of producing adventitious buds upon their upper surfaces and edges; and some leaves, like those of the echeverias, strike root soon after they fall to the soil. Some genera, as the gloxinia, gesnera, clianthus, and others, require to have only the footstalk of their leaves planted in sandy soil, in which, with a proper temperature, they will produce young plants. These leaf-cuttings form, at first, a callosity at their base; then roots; and, lastly, a bud, from which the future plant is organised. Some plants produce this bud more freely than others; while a few exhibit great backwardness in producing it at all.

CHAPTER V.

TREATMENT OF THE SUBJECT; PLANTING FRUIT TREES; THE SORTS AND AGES OF PLANTS; DISTANCES IN PLANTING; PLANTING; TRAINING; PROTECTION OF THE BLOSSOM; ESPALIERS.

TREATMENT OF THE SUBJECT.

What has, in the preceding chapter, been stated in a general way, may, in some particular instances, in this be repeated, when speaking of those trees which more especially belong to the fruit garden. We will, however, avoid this as far as possible, only allowing ourselves to do so when we think greater perspicuity will be given to the special subject of which we may be treating. It has been customary to treat the fruit and culinary gardens as one, seeing that they are in reality often both united. But it is far better to keep them distinct; although this cannot, in many cases, be done because of the want of space. In large establishments, however, where system and order are held to be leading features in the arrangement of the grounds, the fruit and the kitchen gardens should be separately disposed, and each complete in itself. This would be a vast improvement on the promiscuous mode now generally practised; but, as we have said, in places of circumscribed dimensions this cannot be accomplished; so, we fear, that the medley system of huddling fruits and vegetables together within the same enclosing walls, must still be practised; and that it must be a long time before we can expect to see many examples of an entire separation between the culinary and fruit gardens.

PLANTING FRUIT TREES.

In the formation of a garden, the selection and distribution of the different kinds of fruit trees, is one of the most important and interesting points. Those which are adapted for walls, may be considered in respect to their sort, their fruit, the mode of planting them, and the distance at which they should be planted from each other. These are points which ought never to be lost sight of; nor should the advice of Mr. Nicol be forgotten. "I have long made it my business," says this practical gardener, "to persuade my employers, in the planting of new gardens and orchards, to limit the *varieties* of fruit, in the firm conviction that I was acting for their interest; for, certainly, the rage for multiplying them, and of having a numerous collection, has too much prevailed of late. It were better to be contented with a few kinds which produce well in most seasons, than to plant many sorts for the sake of variety, of which a crop is obtained, perhaps, once in three or in seven years. It is, no doubt, of very great importance to select and adapt the kinds to the climate, soil, and aspect; and, in some situations, a greater variety may be planted with propriety than in others. This matter must be determined by existing circumstances, by the fancy of the proprietor, and by the discretion of the gardener."

In selecting the various sorts of fruit trees, and distributing them along the different aspects of the wall, principles should be adopted, and, if correct, as far as possible rigidly adhered to, and acted upon. In selecting fruits to be grown against walls, the general principle is, that the more delicate species of trees, such as the peach, fig, and grape, should be planted in the warmest parts. This is the most congenial situation for them; whilst the next warmest part should be assigned to the more delicate varieties of the hardier fruits, such as the cherry and pear; as well as to such descriptions of the hardy fruits as it may be desirable to bring to a state of ripeness at a very early period. Abercrombie lays it down as a rule, that the best border and wall should be given to the peach, the vine, apricot, fig, and nectarine. These are all delicate fruits; and the vine should, in this country, have the first place in respect to aspect, as it does not readily ripen out of doors north of London. Where a south aspect is not to be obtained for these

delicate fruits, a south-east and south-west are the next best; although some of the earlier kinds of the apricot will attain to maturity on an east or west wall. In so far as regards the cherry, it may be placed in any situation, except that which is directly exposed to the north; but the finest cherries will not arrive at the height of perfection unless they have a south border. The morello cherry, the plum, pear, apple, and mulberry, will succeed on any wall: "but all late fruit is universally improved in proportion to the goodness of the aspect from the west to the east, through all the intermediate points to the south; and some of the high-flavoured French pears require a high wall, and a good aspect, to bring them to perfection." For a free-growing pear tree, the end of a building is a good situation; for if the wall of the garden be not higher than usual, it will not have sufficient room. A long and high wall is also required for fig trees.

THE SORTS AND AGES OF PLANTS.

Standards planted against a wall are in the form of dwarfs and riders, which may be one year old from the graft, or they may be several years trained. The permanent trees are understood to be the dwarfs, the riders being merely temporary plants, introduced to give fulness to the upper portion of the wall. In selecting from both kinds, it is the practice to choose those trees which have passed through the training of two or more years; or should they, every second year, have been moved in the nursery, they may take five or six years to train; and in such case they will bear immediately. Young plants, however, are preferred by some gardeners. Regarding the age of the plants, it is observed by Nicol, that the "maiden, or one-year-trained trees, are to be preferred, especially if apples and pears. Even of the stone fruits such will succeed best; though two or three years' trained are often planted. I here allude to the dwarfs. Riders of greater age than dwarfs may be planted, in any case, with propriety, they being considered temporary, and it being desirable to obtain fruit from them as soon as possible." It is recommended as a safe plan, to plant partly maiden and partly trained plants; by which mode, those which fructify early, should they turn out of inferior quality, may be replaced by others, or re-grafted with improved species. Meanwhile, the kinds to which approval has been given, will afford a return sufficiently early to compensate for any additional labour or expense they may have cost.

DISTANCES IN PLANTING.

The distances at which the permanent trees are planted, are regulated by the known growth of the different sorts selected to be trained against the wall, as well as by the height of that enclosure. It may be remarked, too, that the distance of the stem of the tree from the wall, on the surface of the ground, should be about nine inches. In rearing nectarines, peaches, and vines, this distance may be somewhat diminished. In respect to the height of the walls, there are some slight differences of measurement given. Marshall says, that for one nine or ten feet high, the distances at which nectarines, peaches, and apricots are planted from each other, should be twenty feet. For a wall twelve feet high, Nicol gives the following distances:—apples, eighteen or twenty feet; apricots, from twenty to twenty-four feet; figs, from fifteen to eighteen feet; nectarines and peaches, twelve or fifteen feet; pears, from twenty-four to thirty feet; and plums, eighteen or twenty feet. For low walls, of no more than five or six feet high, apple trees should be planted at thirty feet apart, and plums from twenty to twenty-four feet. "The distances at which wall trees ought to be planted, according to Abercrombie," says Mr. Loudon, "depend on the general growth of the species, connected with these other things—whether the individual plant has been dwarfed by the mode of propagation, or is a free grower; whether the species will bear to be kept within bounds by the knife; and, lastly, on the height of the wall. Thus, a higher wall is a compensation for a reduced distance, and a lower will make it necessary to increase the intervals. Supposing the wall to be twelve feet high, the following are good average distances for planting the kinds named:—Vines, from ten to fifteen feet apart, or in vacant spaces between other walls, where the distance is less, because the vine bears pruning well, and can always be reduced to the prescribed

limits. Peach trees and nectarines, from fifteen to twenty feet. Fig trees, from eighteen to twenty feet or more, as the bearers are not to be shortened. Apricot trees, fifteen feet, for the dwarf early sorts; eighteen to twenty-four feet for the free-growers, as this plant does not bear the knife well. Cherry trees, from fifteen to twenty feet; the strong-growing, large-leaved sorts requiring the wider distance. Pear trees, twenty feet, if on dwarf stocks; twenty-four to thirty feet, if on free stocks. Plum trees, from fifteen to twenty-four feet. Apple trees, if on dwarf stocks, fifteen feet; if on free stocks, from twenty-five to thirty feet. Mulberry trees, fifteen or twenty feet. Along the line of the walls only nine feet high, increase the intervals to one-fifth as much again; and of walls six feet high, to one-fourth."

PLANTING.

It is generally agreed that November is the best month to plant in, as at that time the leaves have mostly fallen to the ground. It is also agreed, that about the middle of December is the period when the tree should be headed back. Before planting, the root of each plant should be trimmed, cutting off the points of those which have been bruised in the taking up, and moderately thinning them out, if too thick, or too much crowded. Maiden trees do not often require this operation; but plants which have, for several years, stood in the nursery, or which have been trained against walls or pales, and have strong roots, frequently require thinning out. The roots should, in some degree, be rendered proportionate to the tops; and as the shoots and branches are to be headed down, or to be considerably shortened or thinned out, as a consequence, the roots should also be moderately thinned and pruned. In performing this operation, however, great care must be taken that the most promising plants, and those furnished with the most fibres, be retained. The spot for planting being determined, a pit, no deeper than that from which the plant has been removed, should be prepared, and the future tree placed just as deep, and no deeper, in the ground than it was before. The roots and fibres should be spread out, and carefully bedded in suitable compost. Then the common earth should be filled in, gently trod upon round the stem, preserving it a few inches clear of the foundation, and securing the plant from the injurious effects of high winds, by nailing it to the wall. Thus, should tree after tree be planted; and they will require no further attention till the following March, when they should be headed down.

TRAINING.

In training, the knife is the grand instrument; and he who has had sufficient experience and practice to be able to apply it with skill, may be said to have a perfect command over his trees. The points which most essentially belong to the operation of training are, that they should be as simple as possible, and the work of amputation or lopping be not too frequently carried on; that it should accord with the growth of the tree; and that it should be such as to render it more easy for the fruit to come to perfection. That these points may the more certainly be secured, it has been laid down as a maxim, that the knife should be used with some degree of reserve, as nothing is more injurious to the health and fructification of fruit trees of every description, than frequent and injudicious cutting.

In placing a fruit tree against a wall, it is evident that it is put into a constrained and unnatural situation, from which it would endeavour to make its escape by every means in its power. Much care is, therefore, necessary to check this tendency, as the more it is permitted to exert itself, the more unsightly must become the form of the tree. He, therefore, to whom the charge of a garden is assigned, should be well acquainted with the theory of vegetation; should make the manner in which different sorts of trees grow a study; and, above all, should never forget the real end or object of all training—*the production of bearing wood*. Perhaps one of the greatest difficulties is to preserve equality in the growth of the several points of the same tree. It should therefore be known that a shoot will push itself forth more vigorously when enjoying a free situation in the open air, than when it is nailed against a wall. Considering this fact, it naturally suggests that, in

training, a weak shoot should be left free, whilst a strong one should be restrained. A shoot slightly turning off from the perpendicular will, *cæteris paribus*, be more plentifully supplied with sap than one which is laid out in a horizontal direction, or deflected from its parent stem. The growth of a luxuriant shoot may, for some time, be impeded by having its tender extremity pinched off, when one of a much weaker description may even surpass it in the capacity of fruit-bearing. By giving attention to these hints and expedients, and making a judicious employment of the pruning-knife, it will be easy for any practical gardener to execute the general forms which trees are made to assume, and which are mostly detailed in horticultural works. The most simple of these, and the most practised for their general excellence, are distinguished as the *horizontal*, the *fan*, and the *half-fan* forms. But the choice of particular modes of training is too often determined by mere fashionable prejudice, which leads to the application of the same form in all sorts of trees. "Thus," says a writer on this subject, "the French are apt to reduce everything to the *fan* system, while some English horticulturists are inclined to force trees of the most rambling growth into the *pillory* of a horizontal arrangement. Such a uniformity cannot possibly be in accordance with nature. The enlightened cultivator will employ various forms, and will determine for himself which is the most appropriate, not only for every species, but even for each particular variety of fruit trees. By attentive observation and rational experiment, more knowledge in this department may be obtained in a few years, than by a whole life spent in routine practice."

PROTECTION OF THE BLOSSOM.

In a climate so variable as that of England, more especially in the northern and eastern parts of the island, it is necessary that the gardener should be furnished with such appliances as will enable him to protect the blossoms of his fruit trees from the late frosts in the season of spring. Frames covered with osnaburg, bunting, and similar light fabrics, have been recommended for this purpose, with the observation that they should be set in a slanting position in front of the trees. It is said that the best protection for wall trees are portable wooden copings about nine inches in breadth, attached to permanent iron brackets, fixed in the wall immediately below the stone coping. These wooden defences should be applied during spring, previous to the commencement of the blossoming and expanding of the buds; and there should be connected with them a material called scrim-cloth—a sort of thin canvas, admitting light very freely, yet, of itself, sufficiently capable to ward off frosts of ordinary severity. This cloth should be let down on the approach of evening, and drawn up again on the return of the morning; but any invention which serves to interrupt radiation, though it may fail to preserve the temperature much above the freezing-point, will act beneficially. Standard fruit trees must be left to themselves; and, indeed, from the lateness of the season at which they flower, they are generally more deteriorated by drenching rains and blight, than by the immediate influences of cold.

ESPALIERS.

In making choice of the trees most suitable for an espalier rail, it may be taken as a general rule, that those which are of a finer quality than can be cultivated with advantage as standards, are the best; and, at the same time, not to take such as require the greater heat and the protection of a wall. "It should be a maxim for all climates," says the Rev. Nathaniel Paterson, who has devoted much of his attention to horticulture, "that fruit, good of its kind, though the kind be inferior, is preferable to that of a better nature, but imperfectly produced. A good crop of codlings is better than a bad crop of golden pippins. . . . Having your walls already furnished with the best sorts that may suit your climate, you have only to go a degree lower in the scale to make up your espaliers. But should your wall be so limited as not to afford room for so many of the better sorts as might otherwise be admissible, it will be proper to cultivate as espaliers certain trees which ought, in other circumstances, to have a place on the wall. That part of your rails which is opposite to the south wall, and has some benefit from its reflection, is the most favourable for such an experiment. At the

medium elevation the Ribston pippin will do well in this situation; for though it will not come to such perfect maturity, it will yet be better than most other fruits, and the tree will prove more healthy than it usually does on the best wall. A jargonelle pear, in the like circumstances, may be not unsuccessfully tried; and in lower situations, failing the extent of wall, a variety of the finer sorts of apples and pears may be raised in this way. The less favourable aspects of the espalier rows must, of course, be fitted up with such as are coarser and more hardy. . . . . It may be remarked that none of the stone fruits do well for training in the espalier mode, save cherries, which bear for a number of years on the old wood; but though they admit of the protection of a net as well as on the wall, yet this method is in other respects less eligible, as the young wood cannot be laid in to the same advantage."

CHAPTER VI.

PRELIMINARY; THE GRAPE-VINE; THE FIG; PEACH; APRICOT; PLUM; CHERRY; PEAR; APPLE; STORING PEARS AND APPLES; QUINCE; MEDLAR; SERVICE-TREE; MULBERRY; CURRANT; THE GOOSEBERRY; RASPBERRY; STRAWBERRY; CRANBERRY; ALMOND TREE; HAZEL-NUT; WALNUT; CHESTNUT.

PRELIMINARY.

In passing to particulars from the generalities into which our treatment of the fruit garden has, to some extent, necessarily led us, we will commence with the more delicate or tender sorts of fruits, and restrict the lists which we shall give to selections from the very best descriptions in present cultivation. It is in the forcing garden alone, however, that many of the finer sorts of fruits can be brought to a state of perfection. To that department we must, therefore, refer the reader for whatever details we give of these, as it is there that, in this country, the artificial processes of vegetation are pursued upon the principles of experimental science, and with a view to attain to the highest results.

THE GRAPE-VINE.

This plant is generally considered to be a native of Persia; thence passing into Egypt, Greece, and Sicily. From this island it was carried into Italy, Spain, and France; and, ultimately, by the Romans into Britain, but at what period is uncertain. That there were vineyards in England in A.D. 280, is certain, if the authority of the venerable Bede is to be believed. But, however this may be, wherever it is now cultivated in England, it is absolutely necessary that it should have a good aspect; and to the north of York, a dessert of grapes cannot be produced without the assistance of a hot wall. It is said that, in the extreme south-west districts of England, grapes, suitable for the manufacture of wine, perhaps equal in quality to those grown in the north of France, might be produced on dwarf standards. Of this we entertain no doubt, unless the climate has greatly changed for the worse, as there is abundant historical testimony, showing that productive vineyards once existed in that part of the island. In the catalogue of the London Horticultural Society, 197 kinds of grapes are enumerated. Some of these, however, are of indifferent quality, and some are utterly worthless. We will, therefore, select the names of a few of those which are considered to be most deserving of the attention of the cultivator.

Black Damascus, Black Hamburg, Black Lombardy, Chasselas Musqué, Frontignan, Muscat of Alexandria, Royal Muscadine, Nice or White Nice, Barbarossa, Black Prince, Esperione, or Turner's Early Black, the Syrian Grape, Stillward's Sweetwater, or Chasselas *Precorce*, Trobbiana, the Verdelho, and White Sweetwater.

The Black Damascus is a late variety, and does not set well; but its bunches are large,

and the berries round and sweet. The Black Hamburg is highly valued, and more generally cultivated in this country for the dessert than any other grape. There are several seed varieties of it in existence. The Black Lombardy is a late and excellent fruit. There are five varieties of the Frontignan, distinguished as the *black*, *blue*, *grizzly*, *red*, and *white*. They are all of great excellence. The Muscat of Alexandria has a most delicious flavour, but it requires a high temperature, and ought to have a vinery set apart for itself. The other varieties require no especial remark, with, perhaps, the exception of the Esperione, which ripens on the open wall in the vicinity of London.

For a vinery of ordinary description, the Black Hamburg, Chasselas Musqué, Stillward's Sweetwater, White Frontignan, Black Lombardy, and Royal Muscadine are recommended. For a slow or late vinery, the Muscat of Alexandria, the Barbarossa (Black and White), the Grizzly Frontignan, the Black Tripoli, and the Canon-hall Muscat. For training against the rafters of a greenhouse, the Verdelho, the Black Prince, Black Cluster, and Esperione, are the most suitable. The grapes usually grown in England against the open wall are—the Esperione, White Muscadine, Miller Burgundy, Groveend, Early Black, Pitmaston, White Cluster, and the White Sweetwater. Both in the north of England and the south of Scotland, hot walls are always required for the cultivation of the grape; but, even with this artificial help, vine-culture can never be calculated on with certainty in this country, if pursued in the open air.

THE FIG.

The fig tree is a native of Asia and Barbary, and was imported to England by Cardinal Pole, about 1525; but it is not a favourite in this country. Gardens of first-rate character, however, should not be without some trees; and the following are in greatest esteem:—

Angelque, Brunswick, Black, White, and Brown Ischias, Large White Genoa, Malta, Marseilles, Nerii, Brown Turkey, Pergusata, and Lee's Perpetual.

The Marseilles, the Brown Turkey, Lee's Perpetual, and the Black Ischia, are the best for forcing; whilst the others are better adapted for walls.

THE PEACH.

Persia is considered the original country of the peach; but this fruit, from time immemorial, has been cultivated in most parts of Asia. The characteristics of a good peach, or nectarine, are firmness of flesh, thinness of skin, depth and brightness of the red colour next the sun, and a yellowish-green next the wall. Its pulp should, also, be of a yellowish colour; and it should be full of high-flavoured juice, with the fleshy part thick, and the stone small. The two principal varieties of the peach, properly so called, is the one (the peach) with a downy skin; and the nectarine with a smooth skin. Each of these varieties is again divided by gardeners into *freestones*, or *pêches*, and *clingstones*, or *pavies*, according as the stone adheres to the pulp, or parts freely from it. In the horticultural catalogue, there are given 183 peaches, and sixty-five nectarines. One would think that invention would fail in finding names sufficient to distinguish such a *family:* we, however, will indicate a few of those most congenial to our climate.

Peaches.—The Acton Scot, Bellegarde (the Galande of the nurseries), Late Admiral, or *La Royale*, Madaleine de Courson, Noblesse, Grosse Mignone, Red Nutmeg or Avant Rouge, Royal George, and Spring Grove.

The Red Nutmeg is one of the earliest, and produces abundantly. All the others are excellent varieties; and one of the very best late ones is the Late Admiral, which ought to be in every collection.

Nectarines.—Of these the best are the Early Newington, the Elruge, Fairchild's Early, Hunt's Tawny, and the Red Roman. We may enumerate a few more first-class nectarines, suitable equally for open-air culture or for forcing. These are, of *freestones*—the Brinion, Downton, Murray, Pitmaston, Orange, Violette Grosse, Duc de Tello, New White, and the Hardwick Seedling. Of *clingstones*—there are the Imperatrice and the Newington Tawny; but these last are not deemed so suitable either for open-air culture or for forcing.

THE APRICOT.

Armenia is the country in which it is sup-

posed the apricot originated; although Pallas states that it is found along the whole range of the Caucasus, the mountains of which, even to their summits, are covered with it. It is described as being, in Japan, a large, spreading tree, full of branches; and in China, as covering the mountains to the west of Pekin. It appears to have been first cultivated in England about 1562. It is used in a raw state for the dessert, and is esteemed next to the peach in the quality of deliciousness. It is also made into jellies, marmalades, and preserves. The following are the principal varieties:—

The Blenheim, Breda, Hemskirke, Moor-park, Musch-Musch, Kaisha, New Early, Roman, Turkey, Large Early, Orange, and Royal.

The Blenheim is of English origin, and a good bearer. The Breda is of the highest excellence, and in the south of England does well as a standard; but the best apricot in this country is the Moor-park, of which there are several sub-varieties, known by different names; and among them Shipley's is the best. The Turkey is an excellent late variety; and the Kaisha has quite superseded the red and white Masculines, which, in former days, were our earliest kinds.

The apricot, being a tree of much stronger growth than the peach, requires more room and pruning, both in summer and winter. The most common error in pruning apricots is the laying-in of the bearing-shoots too thickly. Referring to this tree, Dr. Lindley says that the principal branches "must be trained wider apart than those of peach and nectarine trees; but, in other respects, they should be regulated by the same principles. The main branches of the apricot may be fifteen inches apart."

THE PLUM.

The plum tree, although a native of, or, perhaps, only naturalised in, Great Britain, is supposed to have been originally taken from Asia Minor; for Pliny says that it was brought from Syria into Greece, and thence into Italy. It is frequently found growing spontaneously in our hedges; and in its cultivated state is highly esteemed as a dessert-fruit. "Plums," says Professor Martyn, "when sufficiently ripe, and taken in moderate quantity, are not unwholesome; but in an immature state, they are more liable to produce pains in the stomach, diarrhœa, or cholera, than any other fruit of this class." There are many varieties, ranging from ten to nearly a hundred, as given by different authorities; but the catalogue of the Horticultural Society gives 274 sorts. We notice a few of the best for the dessert, and then select some others, most esteemed for culinary purposes.

The Green-gage (or *Reine Claude* of the French), Coe's Golden Drop, the Drap D'Or, Angelina Burdett, the Blue Imperatrice, the Jefferson, the Reine Claude Violette, the Washington, Reine Claude de Bavay, Cowper's Large Red, Coe's Late Red, D'Agen, Blue Perdrigon, Downton Imperatrice, Lawson's Golden-gage, and the White Perdrigon.

It is supposed that the green-gage was introduced into England by the Gage family; and the foreign name having been lost, or forgotten, the present was given to it, as being the next most appropriate. It is, in every respect, a fruit of the highest excellence. When grown against a wall with an east or a west aspect, the fruit attains to a large size; but, as a wall tree, it rarely bears well till it is old. Coe's Golden Drop requires a wall of the most favourable aspect, and is excellent, both as a table and preserving plum. It does not succeed in a bleak climate. We are informed that the Angelina Burdett, the standard of England, and the Woolston black-gage, were, some years ago, raised from seed by Mr. Dowling, of Woolston, near Southampton. They are all plums of the highest excellence. Speaking of their qualities, Mr. Thompson says—"These plums are first-rate, and I should recommend their extensive cultivation. As regards the last, it throws the green-gage into the shade, for it contains all the properties of that fine plum, with more sugary sweetness. The Jefferson is the best of all the American plums. The Washington is also a good plum, and succeeds as a standard. Cowper's large red is a fruit of great productiveness, and on that account deserves a place in the garden. Gisborne's early plum is one of the best that can be recommended, especially for the northern parts of the island."

Of second-rate plums we may enumerate

the Cheston, Sharpe's Emperor, the Fotheringham, Goliath, La Royale, Wilmot's New Orleans, the Orleans, and the Morocco. There are also some Damasks, which should find a place in the garden. The Early Violet is a capital bearer, and highly recommended by Lindley for cottage gardens.

For preserving, and the use of the kitchen, the following are recommended:—The Caledonia or Nectarine Plum, Isabella, Shropshire Damson, Imperial Diadem, White Magnum Bonum, Red Magnum Bonum or Imperiale, the St. Catharine, the Mirabelle, Bullan, and Wine Sour, Deen's Jedburgh Seedling, Denniston's Superb, Tay-Bank, Topaz, Gisborne's Plum, Guthrie's New Apricot Plum, Pond's Seedling, and Guthrie's Minette.

In training plum trees they require plenty of room, and are chiefly propagated by budding upon Musell or St. Julian stocks. They are sometimes grafted; but when this is the case, gum is apt to exude from the tree at the place of junction. On common walls they should be allowed from twenty to twenty-five feet of breadth, over which to extend themselves; and for this purpose a preference should be given to such as have been trained in the nursery for a couple of years.

THE CHERRY.

In 73 A.C., the cultivated cherry was brought to Italy by Lucullus, the Roman general, who found it growing in Cerasus, the name of a town in Pontus in Asia, and from which the designation given to the fruit is derived. It is supposed to have been introduced by the Romans into Britain; but if such was the case, it would seem that it was suffered to die out. It is stated to have been re-introduced by Richard Harris, the fruiterer of Henry VIII.; but Wharton shows, by a quotation from Lidgate, a poet who flourished about 1415, that the London hawkers exposed cherries for sale in a manner similar to that which is now done in the early part of the fruit season. The tree is very generally cultivated, not only as a wall, but as a standard fruit, and has been introduced to the forcing garden for upwards of a couple of centuries. The fruit is used as a dessert, and for making pies, tarts, and other elegant preparations, in both confectionery and cookery. The Horticultural Society's catalogue, with geans included, gives no fewer than 219 varieties, of which the following may be considered as among the most excellent:—

The Bigarreau or Graffion, Belle de Choissy, Black Tartarian, Amber or Yellow Spanish, Buttener's October Morello, Early Purple Griotte, Elton, Harrison's Heart, the May Duke, Late Duke, Morello, Kentish Cherry, and the Waterloo. Besides these, may be specified the Black Heart, Black Eagle, Early Heart, Bowyer's Downton, Carnation, White Heart, Knight's Early Black, and the Florence.

The Early Purple Griotte is the earliest of all cherries, generally ripening at the end of May. The May Duke is one of the most common, and, at the same time, one of the most valuable of cherries; but the Kentish cherry is one of the oldest and most prevalent of English cherries, much cultivated in the orchards of Kent. It ripens at the end of July, and is commonly grown as a standard. The Morello is a late cherry, much in request for confectionery; and of the same species are the Frogmore, New Morello, and Rumsey's Late Morello. The Bigarreau is an excellent fruit, largely cultivated in England for the London market.

Guignes, or Geans, are cherries, but in a state not so highly cultivated, or so far removed from their natural state. When old they are very prolific, and are usually grown as standards. The Amber Gean, and the Lunclie Gean, are the principal kinds; the former a sweet tender fruit, and an abundant bearer; the latter a small black cherry, of high flavour.

THE PEAR.

The pear tree bears its fruit on wood upwards of one year old, but principally on spurs, and very rarely on two-year branches. In the *Theory of Horticulture*, Dr. Lindley has the following remarks relative to the rearing of this tree:—"Plant a maiden tree in autumn; allow it to establish itself for one year, and then head it back to a good eye, a few buds from its base. Let one shoot grow as strong and upright as possible during the summer, and head it back to within thirteen inches of the

ground in autumn, cutting very close to a bud, in order that the shoot springing from it may form little or no bending. Train it upright; whilst three or four shoots, from buds immediately below it, should be more or less inclined to a horizontal direction, according to their strength; the strongest should be most depressed. These three or four constitute the commencement of the first or lower tier. For the next tier, head back the upright leader to within eighteen inches of its base, if the soil is rich; if not to fifteen inches; and from the shoots produced in the following season from buds, just under the cut, train a shoot for a leader, and three or four somewhat horizontally, as before, for a second tier. Precisely, in this manner, tier after tier must be started, till the tree attains its assigned height. All this can be effected in accordance with the natural disposition of the tree, to form an upright stem, and with the tendency of the sap to develop the uppermost buds of a shortened shoot. But it is not to be done without serious difficulties."

The list given of cultivated pears amounts to upwards of 600. We will, therefore, confine ourselves to specifying a few of the best dessert sorts, both early and late.

EARLY.—Autumn Bergamot or English Bergamot, Early Bergamot, Elton, Beurré d'Amalis, Citron de Carmes (this is the Madeleine of Lindley, and the Premature in Scotland), the Dunmore, Doyenné Blanc, Flemish Beauty, Fondante d'Automne, Mansuette, the Summer Rose, the Jargonelle, Summer Francréal, Duhamel, Seckle, Red Doyenné, the Van Mons Leon Leclerc. The summer and early autumn pears may be added. The Summer Francréal, Summer Bonchretien, William's Bonchretien, and the Musk Robine. These generally require the protection of a wall.

The Jargonelle is the most esteemed, as it is the most common of our early autumn pears. It grows to a large size against the wall; but the fruit does not keep well. The Citron de Carmes is our earliest pear, ripening in July. It is a sweet pear without much flavour. The Summer Rose is an excellent variety, and the Summer Francréal a large bearer. The Early Bergamot is one of our best early pears; and the Autumn Bergamot one of our most richly flavoured. It ripens towards the end of October, but it does not keep.

LATE.—Of late pears the assortment is large; but the following may be viewed as some of the choicest:—Bergamot de Hollande, Beurré Diel, Easter Beurré, Beurré Rance, Beurré Langelier, Brown Beurré, Beurré de Capiamont, Belle de Bourne, Moorfield Egg, Gansel's Bergamot, Bezi de la Motte, Marie Louise, Crasanne, Colmar, Passe Colmar, Poire Neill, and the Urbaniste. To these may be added, as late autumnal and winter pears, the Autumn Colmar, Aston Town, Beurré Spence, Echassery, Bezi Vaet, Bezi de la Motte, Sylvange, Chanmontelle, Glout Morceau, Downtown, Hacon's Incomparable, Duchese d'Angoulême, Swan Egg, Winter Nelis, Flemish Beauty, Napoleon, Brougham, Calibasse, Chaptal, Comp de Laney, Althorp Crasanne, Winter Crasanne, Dundas, Elton, Emerald, De Louvain, Eyewood, Fulton, Groom's Princess Royal, Jean de Witte, Louis Boune of Jersey, Moccas, Ne Plus Mennis, and Knight's Monarch.

Of stewing pears, or the kitchen sorts, we may name—Uvedale's St. Germain, Catillar, Bellisine d'Hiver, the Black Worcester or Warden, and the Gilogil. These are either kept as dwarf standards, or placed on espalier rails, or inferior walls.

Of the early pears, the autumn or English bergamot has long enjoyed an established reputation for the high flavour it possesses. It comes to perfection about the end of October; but it does not keep. The jargonelle is the most esteemed of our early autumn pears; and when grown against a wall, it attains to a very large size. The fruit, however, does not keep well. The others call for no special remark. Of *late* pears, the Brown Beurré is a plentiful bearer; and so is the Beurré de Capiamont. The Moor-fowl Egg is of Scottish origin, and presents us with two varieties, of which the Galston is the best. The tree is hardy, and the fruit of excellent quality. The plant should be grown as a standard. The Marie Louise is a large and an excellent pear, raised by Duquesne. Thompson says it is one of the finest, even as a standard, on which it bears abundantly. The Easter Beurré is hardy, and an abundant bearer. Thompson observes that it is one of the most valuable

of the spring sorts, "compared with which, the early pears of short duration deserve not a wall." The Beurré Rance is the best very late sort yet known.

"Summer and autumn pears," says a writer on this subject, "should be gathered before they are fully ripe, otherwise they will not, in general, keep more than a few days. The Jargonelle, as Forsyth rightly advises, should be allowed to remain on the tree, and be pulled daily, as wanted; the standard fruit thus succeeding the produce of the wall trees. In reference to the Crasanne, Mr. George Lindley recommends gathering the crop at three different times: the first, a fortnight or more before it is ripe; the second, a week or ten days after; and the third, when fully ripe. The first gathering will come into eating latest; and thus the season of the fruit may be considerably prolonged. It is evident that the same method may be followed with the Brown Beurré, and Gansel's Bergamot, or with any others which continue only a short time in a mature state."

THE APPLE.

In a wild state, the apple is a native of most European countries; but when the cultivated fruit first came into Britain is entirely unknown. It is supposed to have been introduced by the Romans, as, in the time of Pliny, these people were acquainted with twenty-two varieties. But, however this may be, we have it, on the authority of Stowe, that carp and pippins were brought to England by Mascal, who, in 1572, wrote on fruit trees. The apple tree never bears, except accidentally, upon young wood. It is on wood two or more years old, and on the stunted branches called "spurs," that its fruit appears. The fruit is principally grown as a standard, which should have a clean, straight, and substantial stem. Of the apple, there are upwards of 1,400 varieties enumerated in the London Horticultural Society's catalogue, of which about one-seventh, perhaps, may be good kinds. To attempt to give detailed descriptions of such a multitude of species would be vain; we shall, therefore, confine ourselves to giving a list of the sorts deemed most worthy of the attention of the grower.

TABLE APPLES.—The earliest of these are the Juneating, or White Geniton, ripening about the close of July; the Red, or Striped Juneating; the White Crofton, an abundant bearer, and useful for the kitchen, as well as the table; the Arbroath Pippin, or Oslin; the Early Julian, or Clydesdale; Summer Golden Pippin; Red Quarrenden, or Devonshire, and the Early Harvest. To succeed these, we have Hick's Fancy, or the Early Nonpariel; the Autumn, or Royal Pearmain; the Doonside; Baird's Favourite; White Astrachan; Red Astrachan; Shepherd's Fame; Pearson's Plate; Old Golden Pippin; Franklin's Golden Pippin; Pomme de Niege; Maclean's Favourite; King of the Pippins, or Hampshire Yellow, a valuable variety; Kerry Pippins, one of the best of the Irish apples; Cole Apple, or Scarlet Perfumed; Leishman's Pippin, and Longville's Kernal.

Winter dessert apples being in great force, we can only enumerate a few of the best. The Ribston Pippin has long held a high character, not only for the richness but the highly aromatic flavour of its juice. Hubbard's Pearmain is of the finest quality; the Golden Harvey, or Brandy Apple of Forsyth, though a small, is a capital fruit, characterised by Mr. Lindley as juicy, rich, and finely flavoured. It has the quality of great hardiness, and is an abundant and a constant bearer; and no garden in which a dozen trees can be contained, ought to be without one. The Dounton Pippin is also an excellent fruit, and a large bearer; it ripens at the end of October, and keeps till January; the Yellow Ingestre; the Berehamnell; Court of Wick Pippin; Wood's Transparent; Scarlet Crofton; Scarlet Pearmain; Dutch Mignonne; Fearn's Pippin; Paradise Pippin; Old Nonpareil; Braddick's Nonpareil; Scarlet Nonpareil; Pitmaston Nonpareil; Kirke's Golden Kennet; Sykehouse Russet; Cornish Aromatic, a famous apple; the Sam Young, an Irish fruit; and the Norfolk Beaufin, which is the best apple for drying and preserving, making an admirable winter fruit.

DESSERT APPLES.—The Baddon Pippin, and Barton's Incomparable, are excellent; as are the following:—Ashmead's Kernel; Clara Pippin; Christie's Pippin; Cockle Pippin; Cornish Gillyflower; Creed's Mari-

gold; Colonel Vaughan's White Crofton; Elford Pippin; Forman's Crewe; Scarlet Golden Pippin; Golden Russet; New Golden Pippin; Winter Golden Pearmain; Claygate Pearmain; Herefordshire Pearmain; Lamb Abbey Pearmain; Scarlet Pearmain; Royal Pearmain; Keeping Russet; Reinette Franche; and Powell's Russet.

Of American apples, the most suitable for our climate is the Boston Russet.

KITCHEN APPLES.—Under this specification we mean such as are principally used for tarts or sauces; and they are so very numerous that the names of some of the best can only here be given. The Nonsuch, Hanwell Souring, Fulwood, Menshul Crab, Alexander, Blenheim Orange, Wheeler's Russet, Cat's Head, Forman's Crewe, and the Hunthouse of Yorkshire, are all held in high estimation. The Bedford Foundling is a certain bearer, whilst it is a large and handsome fruit; and the Cellini is a good apple for November. Some of the best apples for keeping long are Scottish Gogar Pippin; Monerieff, or Stone Pippin; the Wormsley Pippin; Baxter's Pearmain; Winter Strawberry Apple; the Yorkshire Greening; the Northern Greening; the Calvill Malinger; Winter Lud; Pentearland Pippin; Cockle Pippin; Green Fulwood Alfriston; Beauty of Kent; London Pippin; Hawthornden; Glory of England; Pope's Apple; Royal Russet; Carlisle Codlin; and the Eastern Pippin.

STORING PEARS AND APPLES.

For this purpose there should be attached to every considerable garden, a well-ventilated, commodious fruit-room, fitted up with the necessary drawers and shelves, and such other conveniences as may be found requisite. Forsyth says—"The fruit on shelves should be turned two or three times during the winter; as delicate and tender fruit, by lying long without turning, is apt to rot on the under side, even if perfectly sound when laid up. Be particularly careful, however, to pick out all the damaged fruit. When the fruit is laid in, put the earliest sorts on the lower shelves or in the lower drawers, according to their time of coming in, beginning with the Nonsuch, Golden Rennet, and Juncating apples; and Bergamot and Beurré pears. Thus, by proper management, you may have a constant succession of fruit from one season to the other." The best way of keeping fruit, however, is to pack it in glazed earthen jars. "The pears and apples must be separately wrapped up in soft paper; then put a little well-dried bran in the bottom of the jar, and over the bran a layer of fruit, then a little more bran to fill up the interstices between the fruit, and to cover it; and so on, a layer of fruit and bran alternately, till the jar be full; then shake it gently, which will make the fruit and bran sink a little; fill up the vacancy at top with more bran, and lay some paper over it, covering the top with a piece of bladder, to exclude the air; then put on the top or cover of the jar, observing that it fits as closely as possible. These jars should be kept in a room where you can have a fire in damp weather."

THE QUINCE.

This fruit is a native of Austria, and other parts of Europe, and, in 1573, is mentioned by Tusser; but it does not seem to have ever been much cultivated in this country. The tree is much branched, of low growth, and generally distorted. Two or three trees are usually sufficient to be planted either in the slip or the orchard. They may be propagated either by grafting, by layers, or by cuttings; and the two principal sorts are the Portugal Quince and the Pear Quince, the latter being the most productive, and serving for all culinary purposes equally well as the former.

THE MEDLAR.

The Medlar is a native of the south of Europe, but appears to have been naturalised in some parts of England, by birds which, in their migrations, have sown it in copses. This is the opinion of Mr. Loudon. The varieties most worthy of notice are the Dutch Medlar with broad leaves, and the Nottingham Medlar with narrow leaves. The fruit is gathered in November, and kept till it begins to decay, when it is served up in the dessert, and much relished by some. The tree is propagated by seeds, layers, cuttings, or grafting on seedlings of their own species. The plant,

however, is somewhat difficult to strike by cuttings.

THE SERVICE-TREE.

This tree is a native of the mountainous parts of Cornwall, and, though not much cultivated, must not be entirely overlooked. Its fruit has a peculiar kind of acid flavour, and is used only when thoroughly mellowed by keeping. There is both a pear-shaped and an apple-shaped variety, both of which may be propagated by layers, or by grafting on seedling plants of their own species.

THE MULBERRY.

This is a fruit but little known in Scotland, although, in old gardens, there are to be found some aged trees which, in favourable seasons, yield some berries. The plant is originally from Persia; and, in this country, requires to be cultivated in warm situations. During the months of August and September, the fruit is in request for desserts, possessing a rich aromatic flavour, and a fine sub-acid juice. Where it grows abundantly, wine is made from it: and, in Devonshire, a little of the juice added to full-bodied cider, produces a delightful beverage, known as Mulberry Cider, which preserves its flavour for several months. The tree is propagated by layers or by cuttings; also by branches of an inch or more in diameter.

THE CURRANT.

Under the general title of Small Fruits, the red, white, and black currant, the gooseberry, the raspberry, the strawberry, and the cranberry are usually cultivated in this country. Their uses in cookery, confectionery, as well as in making some wines, give them considerable importance. Besides our red and white currants, there are included, in the *Ribes Rubrum*, many sub-varieties. Among these may be noticed as the principal—the Ruby Castle, the Dutch Red, Knight's Early Red, Knight's Sweet Red, Wilmot's Large Red, Goodwin's Red, Champagne, Dutch White, Woolly-leaved Dutch, Victoria White, and Wilmot's New White.—The Black Currants comprise the Common Black, Black Naples, and Ogden's Black Grape.

Red and white currants are easily propagated by cuttings, and succeed in any sort of common garden soil. They thrive best, however, in warm moist situations, where they may have the benefit of plenty of air. When planted by themselves, in separate compartments, or trained as dwarf standards, or as bushes from single stems of about a foot high, they are best: but care must be taken that the principal branches do not cross each other. In winter, the young bearing-wood is shortened down into spurs of from one to two inches in length.—The Black Currant succeeds best in a shady situation, with a deep, moist soil. Its culture is much the same as that of the other currants, only the young shoots are not spurred.

THE GOOSEBERRY.

The bush which bears this exquisite fruit is a native of several parts of Europe; and, in the Vallais, abounds in copse-woods, where it produces a small, green, hairy, and highly-flavoured fruit. In England it has been naturalised in various places against old walls, among ruins, and in the woods and hedges about Darlington. In Lancashire it is cultivated in greater perfection than in any other part of Britain. The following are some of the sorts recommended by the London Horticultural Society. Of the YELLOW KIND—the Golden Yellow, the Yellow Ashton, and the Yellow Champagne, the Smooth Yellow, Smiling Beauty, Rumbellion, Sulphur, and Yellow Smith.—Of the RED KIND—the Rob Roy, Ironmonger, Red Champagne, Keen's Seedling, Small Red Globe, Lord of the Manor, Leigh's Rifleman, Wellington's Glory, Shipley's Black Prince, and the Red Warrington.—Of the WHITE KIND—the Cheshire Lass, White Champagne, White Crystal, Bright Venus, White Damson, White Smith, and the White Honey.—Of the GREEN KIND—the Green-gage, Pitmaston, Langley Green, Green Gascoigne, Green Laurel, Late Green, Gregory's Perfection, Green Walnut, Cupper's Bonnie Lass, and the Jolly Tar.

The gooseberry-bush thrives best in a loose, rich soil, which readily absorbs, but does not retain much moisture. It may be propagated by all the modes of application to shrubs or trees; even by pieces of the roots; but the mode usually adopted is by cuttings for con-

tinuing varieties, and that by seeds for procuring them.

THE RASPBERRY.

This is a native of Britain, and is very often found in woods where the situation is low and moist. The fruit is grateful; but sugar used with it heightens the flavour, which helps to make it much esteemed when made into sweetmeats, jams, tarts, and sauces. The best varieties are the Red Antwerp, Yellow Antwerp, Barnet, Cornish, Red Globe, Belle de Fontenay, Coxe's Honey, River's Large-fruited Monthly, Roger's Victoria, Franconia, White Monarch, White Globe, and Falstaff; which last is the most profitable.

In propagating the raspberry, "varieties can be perpetuated by young sucker-shoots, rising plenteously from the root in spring and summer. When these have completed one season's growth, they are proper to detach with roots for planting, either in the autumn of the same year or the next spring, in February or March, but not later than the middle of April. These new plants will bear some fruit the first year, and furnish a succession of strong bottom shoots for full bearing the second season. New varieties are easily raised from seed; and they come into bearing the second year."

THE STRAWBERRY.

This fragrant, delicious, and universally-esteemed fruit, is a native of temperate or cold climates, such as Europe and America. In the catalogue of the London Horticultural Society, no fewer than 112 varieties are given; but the following are sufficient for any garden, as they are the most worthy of cultivation:—Cuthill's Black Prince, for its early ripening qualities; Grove-end Scarlet, most suitable for preserving, on account of its fine carmine colour; Elton, on account of its late ripening; British Queen; Myatt's Pine; Deptford Pine; Eleanor; Ingram's Prince of Wales; Keen's Seedling; Princess Royal; Princess Alice Maud; Trollop's Victoria; Nicholson's Ajax; White and Red Alpine; Sir Harry Myatt's Mammoth; Large Flat Hautbois, and Comte de Paris.

Scientific gardeners have different modes of growing the strawberry; and among these we believe that the experiments of Mr. Cuthill, of Camberwell, have been very successful. The present writer has been shown, by this excellent grower, numerous medals presented to him as prizes, for the various varieties he has produced by his judicious mode of cultivating this fruit. "The plants multiply spontaneously every summer, as well by suckers from the parent stem as by the numerous runners, all of which rooting and forming a plant at every joint, require only removal to a bed where there is room for them to flourish. Each of these, separately planted, bears a fine fruit the following season, and will bear in full perfection the second summer. A plantation of the Alpine yields fruit the same year that it is made. The wood and the alpine come quite true from seed, and bring a finer fruit than from offsets. The other species are uniformly propagated by offsets, except the intention be to try for new varieties."

In reference to the soil and site most suitable for strawberries, Neill says that they are generally placed in a compartment of the garden by themselves, and it should be one which is freely exposed to sun and air. They are sometimes, however, planted in single rows, as edgings to borders; and in this way they often produce great crops. In either case, care must be taken to re-plant them every fourth or fifth year at the furthest. The alpine and wood species may be placed in situations rather cool and shady; perhaps as an edging in the shrubbery. In such places they produce their fruit perfectly well, and late in the season, which is desirable.

THE CRANBERRY.

This plant is a native of North America, and was known to Miller, who, of the tribe in general, says—"They can only be cultivated for curiosity in gardens, for they will not thrive much, nor produce fruit out of their native swamps and bogs." The culture of the cranberry, however, need not now be confined to swamps and bogs. Salisbury says that it may be cultivated very successfully in situations not positively wet, if only planted in bog earth, which retains its moisture longer than any other soil. Hallet found both the cranberry and the bilberry to succeed perfectly in a dry bed of peat earth; so that it may be cultivated in any garden

where that kind of soil exists, or can be procured.

THE ALMOND TREE.

This is a native of China, and may be noticed here, although its importance as a fruit tree in this country is very little. Every good garden, however, should contain a tree or two as standards. In very fine seasons they will yield a crop; and in spring they are always ornamental, from the beauty of their blossoms. The sorts most worthy of notice, are the Tender-shelled Sweet Almond, or Jordan; and the Common Almond, or Bitter. The tree is generally budded on seedlings of its own kind; but, for heavy soils, plum-stocks are preferable.

THE HAZEL-NUT.

Of nuts the hazel is indigenous to this country, and is the original parent of the Red and White Filbert, the Cob-nut, Cosford-nut, Frizzled, Spanish, and other improved varieties. The whole of these thrive best in a rich dry loam, carefully worked, and receiving from time to time a slight application of manure. It is the usual practice to plant them in slip; but they succeed best by themselves in an open quarter. The mode of propagating them is by suckers or layers; and where there are stocks of the common hazel, the other sorts may be grafted upon them. Preference is generally given to the Cosford, on account of the thinness of its shell, and its possessing a kernel of high flavour. If the Filbert or Cosford be grafted on small stocks of the Spanish nut, which grows fast, and does not throw out side suckers, small yet fruitful trees may be obtained. By pruning the roots in autumn the trees may be kept in a dwarfish state.

THE WALNUT.

The tree which produces the walnut is originally from Persia, or the south of Caucasus; it does not, therefore, arrive at complete maturity in this island, except in the warmer districts. The common walnut is well known; but, besides it, there are several cultivated varieties, which are held in much esteem. These are the Large-fruited, or Double Walnut; the Tender-shelled; and the Thetford, or Highflyer. This last is by far the best walnut grown. It is only by budding that the varieties can be propagated with certainty; but this operation being rather delicate, frequently does not succeed. Upon this subject, that great gardener, Knight, observes—"The buds of trees, of almost every species, succeed with most certainty when inserted in the shoots of the same year's growth; but the walnut tree appears to afford an exception; possibly, in some measure, because its buds contain within themselves, in the spring, all the leaves which the tree bears in the following summer, whence its annual shoots wholly cease to elongate soon after its buds unfold: all its buds of each season are also, consequently, very weedy of the same age; and long before they have acquired the proper degree of maturity for being removed, the annual branches have ceased to grow longer or to produce new foliage." Notwithstanding many difficulties with which Mr. Knight had to contend, he at length succeeded in propagating the walnut tree by budding; but, as we have said, it is a very nice operation. The tree has generally been propagated by the nut; and this mode is recommended both by Miller and Forsyth; probably, Mr. Loudon thinks, from their not having known that the tree may be continued by inoculation, as successfully practised by Knight.

THE CHESTNUT.

Some of the oldest trees in the world belong to this species, which is supposed to have been originally brought from Sardis, in Italy, by Tiberius Cæsar. It is so common there, as well as in France, as to be considered native to the soils of each country. Some consider it to have been naturalised in England; but, however this may be, it is well known to have been long an inmate of our forests. Several varieties have obtained celebrity, especially Knight's Prolific, the New Prolific, and the Devonshire. These are propagated by grafting upon stocks raised from nuts; and when grafts are taken from bearing-wood, fruit may be produced in a couple of years. It is on a dry sub-soil that the tree succeeds best.

CHAPTER VII.

FORCING; RESTING; BUILDING OF HOT-HOUSES; APPLICATION OF ARTIFICIAL HEAT; CONSTRUCTION OF BOILER; DIFFERENT MODES OF HEATING; SCIENTIFIC INSTRUMENTS; SOLAR HEAT; LIGHT AND AIR; THE VINERY; THE PEACH HOUSE; THE FIG-HOUSE; THE CHERRY-HOUSE; THE PINERY; THE MELONRY; THE CUCUMBER.

FORCING.

In the science of horticulture, the term *forcing* signifies the art of raising, by artificial heat, plants, flowers, and fruits at an earlier season than that to which nature has assigned them. To what nation or people we are indebted for the discovery of this art, we believe no one has yet shown; at all events, it could not have been made in those Oriental countries where the genial warmth of the climate is such as to produce two or three harvests within the year, and to furnish, spontaneously, successions of the finest fruits and vegetables known to man. It must, therefore, have been made in some of the nations of Europe where the climate is always more or less variable and uncertain. From Martial we learn that the Romans were acquainted with the use of hot-houses; but whence they borrowed the idea of their uses and structure nowhere appears. Tiberius Cæsar, being fond of cucumbers, erected houses in his garden, and had them heated by means of stoves throughout the year. Pliny informs us that they were grown in boxes, which were, in fine weather, wheeled out into the open air, and returned to their artificial abodes in the nights or in cold weather. With the construction of flues the Romans were well acquainted, so they possessed the knowledge of the means of heating the houses constructed for the artificial ripening of their fruits and vegetables. In England, hot-houses for the growing of *pines* do not seem to have been known in the beginning of the eighteenth century. We infer this from the fact, that Lady Mary Wortley Montague, on her journey to Constantinople, in 1716, makes the remark of pine-apples having been served to table in the dessert, at the Elector of Hanover's—a circumstance she had neither seen nor heard of before. Had pines been then raised in England, she, as a lady moving in the highest circles, must have frequently been regaled with them at the tables of the great.

RESTING.

As there is a forcing system in the science of horticulture, so is there a resting system, which consists in exposing a plant to a condition in which it cannot grow. This is analogous to its winter state. In reference to what relates to forcing, this is a very important point for consideration. "If we look over the different climates of the world," says the author of the *Theory of Horticulture*, "we shall find that in each there are a season of growth, and a season in which vegetation is more or less suspended; and that these periodically alternate with the same regularity as our summer and winter. I do not know that there is in nature any exception to this rule; for even in the Tierra Tempeleda of Mexico, where it is said that, at the height of 4,000 or 5,000 feet, there constantly reigns the genial climate of spring, which does not vary more than 8° or 9°—intense heat and excessive cold being alike unknown, and the mean temperature varying from 68° to 70°—we cannot suppose that even in that favoured region a season of repose is wanting; for it is difficult to conceive how plants can exist, any more than animals, in a state of incessant excitement. Indeed, it is pretty evident that these countries have a period when vegetation ceases; for Xalefra belongs to the Tierra Tempeleda; and we know that Ipomœa Purga, an inhabitant of its woods, dies down annually, like our own Convolvuli. We also know that jonquils, hyacinths, and tulips, when grown in the Bahamas, where they are unable to take the rest which is natural to them, refuse to flower." The author goes on to say, that, although plants have naturally a season of repose, their winter is not, in all

cases, cold. In the tropics it is marked by coolness and dryness, while the summer is rainy and very hot; and in extra-tropical countries the two seasons vary in their character, in accordance with latitude and local circumstances.

The above is sufficient to lead to the conclusion, that "the natural resting of plants from growth is a most important phenomenon of universal occurrence, and that it takes place equally in the hottest and the coldest regions. It is, therefore, a condition necessary to the well-being of a plant, not to be overlooked under any circumstances whatever; and there cannot be any really good gardening where this is not attended to in the management of plants under glass. Rest is effected in one of two ways—either by a very considerable lowering of temperature, or by a degree of dryness under which vegetation cannot be sustained."

BUILDING OF HOT-HOUSES.

It is not necessary that we should recapitulate here what has already been written by many authors on this subject: it may be remarked, however, that the improvements in the construction of hot-houses have by no means kept pace with those which have, within these few years, taken place in other departments of gardening. In the *Annals of Horticulture*, a writer observes—"There is yet much which remains to be realised in the erection of houses for the cultivation of plants, not only as regards their number and dimensions, but also their arrangement and details. We seldom see more than the same kind of flat lean-to or span roofs; the same kind of formal stages where the plants are grown in pots; and the same kind of formal beds when the latter are planted out in borders of prepared soil. Even refinements or elegancies of construction fail to invest such buildings with any character of distinctness or novelty, owing to the sameness or monotony which forms the basis of the design." Since this was written, however, there have been improvements in the construction of hot-houses. This has, perhaps, been more especially the case in regard to the roofs. Among these, the ridge-and-furrow form, as it is called, may be considered the greatest. It was, in 1816, first suggested by the late Mr. Loudon, and afterwards admirably worked out by the late Sir Joseph Paxton, in the large house at Chatsworth and elsewhere; but more recently in covering in nearly twenty acres of ground for the Exhibition in Hyde Park. This, at the time, was the largest building ever constructed of timber, iron, and glass; and showed, with the most perfect clearness, the possibility of extending the same description of pillared covering over any space, however extensive.

In discussing the merits of this subject in his *Book of the Garden*, Mr. C. Mackintosh says, that "the greatest advantage of a ridge-and-furrow roof is, that any extent of area may be covered without internal walls. Indeed, no walls whatever are required, as the sides and ends may be glass close to the ground—the whole being supported on cast-iron tubular columns, with cast-iron valleys, or gutters. A good idea of the effect and practicability of roofing over a whole garden, may be obtained by a careful examination of some of our most extensive railway stations—that at Derby, for example, which, we believe, could be extended over a hundred acres, if required."

We do not wish to enlarge upon this subject; but it may not be amiss to give, in Sir Joseph Paxton's own language, an explanation of the *principles* of this improved sort of roof. In a lecture which he delivered before the Society of Arts, in London, he says—"In the construction of glass-houses requiring much light, there always appeared to me to be one important objection. In the plain lean-to or shed roofs, the morning and evening sun—which is, on many accounts, of the greatest importance to forcing fruits—presented its direct rays at a low angle, and, consequently, very obliquely to the glass. As, at those periods, most of the rays of light and heat were obstructed by the position of the glass and the heavy rafters, so that a considerable portion of time was lost both evening and morning, it consequently became evident that a system by which the glass would be more at right angles to the morning and evening rays of the sun, would obviate the difficulty, and remove the obstruction of the rays of light entering the house at an

early and late hour of the day." By this mode of reasoning, suggested by close observation, he was led to adopt the ridge-and-furrow principle for glass roofs, which places the glass in such a position, that the rays of light in the mornings and evenings enter the structure without "let or hindrance," and present themselves more perpendicularly to the glass at those periods when they are least powerful; whereas, at mid-day, when they are most powerful, they present themselves more obliquely to it.

APPLICATION OF ARTIFICIAL HEAT.

Hot or forcing-houses are heated by different means, and in various ways. The means are by *flues* and *pipes;* and the ways are in allowing the former to convey both smoke and air through the building; and the latter to conduct steam or hot water in any given direction. The other means are by constructing the forcing-house in such a manner as will enable the calorific action of the sun's rays to be increased; and, occasionally, by the heat which is produced by the process of fermentation of vegetable substances: this mode, however, is rapidly disappearing from amongst us. The smoke-flue is now pretty generally abandoned for the hot-water pipe, which possesses many advantages over the former. In the first, it is more lasting; in the second, it requires much less space; in the third, it admits of being placed in situations where the flue could not be placed; in the fourth, it yields a more uniform heat; in the fifth, it can rarely be over-heated—a great matter in a forcing-house; in the sixth, it is much more cleanly and elegant; and, in the seventh, it seldom gets into such a state of disrepair as to require mending. On the other hand, the flue is liable to burst by explosion from the ignition of the inflammable gases generated within. This, of itself, is condemnatory to the flue; and although the pipe is more costly than the flue at its first erection, it has usually been found the cheapest in the end. It must be remembered that noxious gases cannot be prevented from entering the structure, be the flue ever so well built; and when it is considered that these gases consist of sulphurated, phosphorated, and carburated hydrogen, besides various comparts of nitrogen and carbon—all of which are extremely injurious, not only to vegetable, but to animal life—it need excite no surprise that the preference has been given to steam over smoke, in the heating of the forcing-house. Besides, the bricks usually employed in constructing the flues, have, from the softness of their texture, the power of withdrawing from the air of the house much of the moisture necessary for the health of the plants—a power which the hot-water pipe, being unabsorbent, does not possess. Upon this subject, the *Book of the Garden* thus delivers its opinion —"Heating by hot water is, undoubtedly, the most wholesome form yet adopted; and, in its various modifications, it may be applied to all kinds of structures. The temperature it produces is uniform and moderate when compared with hot-air stoves, flues, or steam. There are a few cases, however, which should be noticed, where heating by hot water would be attended with more expense than is necessary; and these are small green-houses and nurserymen's plant-houses, where only half-hardy plants are kept, and where a well-constructed flue can be introduced without occupying much space. These only require heat sufficient to exclude frost; and they might be heated by an Arnott's, White's, or other stove, *placed outside* the building. In ordinary winters, it might not be necessary to use the stove above a dozen times; and as frost, in general, sets in pretty suddenly, these houses would, by such means, be heated in less time than by a hot-water boiler and pipe."

The length into which a complete consideration of this subject alone would lead us, would occupy more than the space allotted to us for the treatment of horticulture in this work: we must, therefore, content ourselves by referring the reader to the numerous systems which he will find explained, and illustrated by diagrams, in the *Book of the Garden*, by Mr. Charles Mackintosh. After all that has been said, written, and practically carried out in this matter, it would appear that we have still to be supplied with a proper heating apparatus for the forcing-house. In an excellent paper read by John Rogers, Esq., before the Horticultural Society of London, we find him declaring this fact. After alluding to the many and various modes which have been

adopted for heating forcing-houses, and acknowledging the decided superiority of the hot-water system over all other methods, he states that the saving of fuel is equal to 25 per cent. in well-arranged hot-water apparatuses, over flues, however well arranged or well managed they may be. He, however, at the same time, observes that many of the modes, even at present in use, are so defective, that they actually consume a greater amount of fuel than ordinary furnaces: he then adds that "this remark applies not merely to the earlier apparatus, when the power was inadequate to the work required, but even to the best-constructed modern ones; and the waste of fuel arises from a misunderstanding of the nature of a hot-water apparatus, and from an attempt to make it do that which, if it be properly constructed, it is impossible that it should do."

CONSTRUCTION OF THE BOILER.

Almost every variety of form has been suggested, and even practically carried out, in the construction of the boiler designed to heat water for the forcing-house. As a matter of course, many of these are of no value whatever; but in the *Gardener's Magazine* we find the rationale of the process of heating the conical boiler, invented by Mr. Rogers, of Sevenoaks, Kent, thus given:—"As fuel cannot be consumed without air, if a furnace be constructed of considerable depth, and filled with fuel, and air be admitted only at the bottom, that fuel alone is consumed which lies immediately on the bars, and first receives the draught of air. The fuel above, provided it transmits the air, becomes red-hot, or nearly so; but does not consume until that below it is destroyed. In this manner, one of these conical furnaces being lighted and filled with fuel, that portion in the upper part of the furnace which cannot burn, absorbs the heat of the burning fuel below, and radiates or transmits it to the water on every side. So perfect is this absorption of heat, that for several hours after the furnace has been filled up with cinders, though there may be a fierce fire below, little or no heat escapes up the chimney—the whole being taken up by the surrounding water. The economy, therefore, of fuel in such an apparatus is very great. It is evident that excess of draught must be carefully guarded against, so much only being allowed as will consume the fuel steadily; but this is easily learned by experience. The necessity, also, of keeping the aperture in front close, so that air enters the furnace only through the ash-pit, is, hence, evident. The water is (then) in close and immediate contact with the red-hot fuel on all sides, no black, smoking coals intervening, as in most kinds of boilers; hence the great power in proportion to size." In commenting upon these boilers, another writer says, that the economy in fuel is not their chief advantage; their great recommendation being a long and steady heat. When properly managed, this heat may be relied upon from fifteen to twenty consecutive hours. They have been successfully applied to all kinds of hot-houses; but for pits they are eminently useful, from the limited space they occupy. When fired with coke, gas-cinders, or anthracite, they give off very little smoke.

DIFFERENT MODES OF HEATING.

An ingenious method of heating has been exhibited by Mr. Fowler, in a tract written on an instrument which he terms the thermosyphon. By this contrivance, he shows how walls, as well as glass-houses, may be heated. He says, that any one may prove that hot water will circulate in a syphon, by taking a piece of lead pipe, say of half an inch in bore, and four or five feet long, bending it like a syphon; but one leg a good deal more bent than the other, in order to give the descending water time and space for giving out its heat; and then filling this tube with water, and placing one hand on each end to retain it full, immerse the extremities in a pot of water over a fire. Supposing the water of a uniform temperature in both legs of the syphon, no circulation would take place; but supposing it to cool sooner in the long leg than in the short one, then the equilibrium would be destroyed, and the water in the long leg would descend and draw up water through the short leg. This circulation would continue as long as the water was preserved at a temperature above that of the surrounding atmosphere.

Another invention is Mr. Kewley's adaptation of the syphon to heating purposes.

Mr. Perkins constructed an apparatus consisting of small tubes, hermetically sealed, in which water circulated at a temperature varying from 300° to 400° Fahrenheit. This invention, however, is unsuitable for horticultural purposes.

Besides these, there is a mode of heating, applied by Mr. Rendle, of Plymouth, in which tanks, in place of gutters or pipes, are employed, and which is designed to be adapted to the purposes of both surface and bottom heating. These tanks are built of brick or stone, or made of cast-iron or wood. When made of wood, the planks require to be good and sound, not less than a couple of inches thick, well jointed; and they are usually covered with slates. If they are built of brick or stone, the inside should be clothed with a thick coating of Roman cement; and their covers should consist of slate, stone, or brick pavement. The cast-iron tanks have covers of the same materials. In describing this mode of heating, a writer observes, that "when only one tank is fitted up in a house or pit, a division is made along the centre, leaving an opening at the end furthest from the boiler for the water to flow through; the hot water, or flow-pipe from the boiler, being fixed to the end of the tank on one side of the division; and the cold water, or return pipe to the boiler, being fixed to the end on the opposite end of the division. When two tanks are used, they are joined to the flow and return pipes respectively, and united at the extreme ends. In pits, the tanks may be carried round the sides and ends of the pit, with a division between the flow and return pipe." It would appear that the advantage to be gained by this plan of heating, consists in its adaptation to the production of bottom heat. It is necessary, however, that provision should be made for preventing no more of the steam or vapour rising from the hot water (into the house) than is required. If this precaution be not adopted, there will be too much damp, in the winter season, for the proper growth or preservation of the plants.

In closing this important branch of our subject, it should be remarked that, in the management of artificial heat, it is necessary to exercise a considerable degree of care. All the operations of nature being in opposition to those of artificial force, and being gradual, the best plan is to follow them. The skilful horticulturist will, consequently, apply his heat, at first, very gradually. He will, for several weeks, slowly increase it by degrees; and, especially, he will watch that no sudden decrease of warmth occurs, as nothing more certainly insures success, than that the course of vegetation be continued uninterruptedly through foliation, inflorescence, and fructification. He will make the temperature increase by day, and decrease by night; to rise in summer, and to fall in winter. In short, the operations of the sun shall be his guide: by its natural and varying influence he shall be ruled.

SCIENTIFIC INSTRUMENTS.

The scientific instruments absolutely necessary to the horticulturist, are a Fahrenheit thermometer, which is not only an indispensability in the forcing-house, but is required in almost every department of his professional practice. Six's registering thermometer is also a convenient instrument for ascertaining the extremes of the temperatures of night and day. Besides the thermometer, the hygrometer is very necessary to the hot-house, as it measures the quality of elastic vapour in the atmosphere; and thus enables us to ascertain the degrees of its humidity. In the *Theory of Horticulture*, it is observed, that "skilful balancing of temperature and moisture in the air, and a just adaptation of them to the various seasons of growth, constitute the most complicated and difficult part of a gardener's art. An excess of dampness is indispensable to plants in a state of rapid growth, partly because it prevents the action of perspiration from becoming too violent, and partly because, under such circumstances, a considerable quantity of aqueous food is absorbed from the atmosphere, in addition to that obtained by the roots. But it is essential to observe, that when not in a state of rapid growth, a large amount of moisture in the air will be prejudicial rather than advantageous to a plant; and if the temperature is, at the same time, high, excitability will remain in a state of continued action, and that rest which is necessary will be withheld; the result of

which will be an eventual destruction of the vital energies. But, on the other hand, if the temperature is kept low, while the amount of atmospheric moisture is considerable, the latter is absorbed without it being possible for the plant to decompose it."

SOLAR HEAT.

Perhaps it might be deemed an omission if we did not take notice of the solar rays, being a species of artificial heat, when reflected from other surfaces. Mr. Mackintosh, referring to this subject, says—"This species of heat is materially affected by the admission of the air necessary to the growth and healthy state of the plants. Solar heat, if properly regulated by ventilation, is of immense importance in the ripening of many of our finer fruits. In the orchard-houses, brought into notice by Mr. Rivers, fruits are ripened by the influence of solar heat alone. The idea is, however, by no means new. We have known many glass-houses in which peaches and grapes have ripened in the greatest perfection, without any other heat than that of the sun. . . . . The management of the temperature consists solely in the proper regulation of the ventilators, securing as much solar heat during the day as possible, ventilating early in the morning, and shutting up early in the afternoon."

LIGHT AND AIR.

Whatever may have been the nature of the experiments of natural philosophers in investigating the laws of light, and the effect which the different coloured rays produce upon the vegetable kingdom, the conclusion arrived at by Mr. Lindley is, that the white light which is natural to plants, is, therefore, the one best adapted to their constitution. Mr. Hunt, who has given much patience to experimenting upon this subject, has still, according to Mr. Lindley, failed in arriving at any valuable practical results in his investigations. "No advantage seems to have resulted from glazing the great palm-house, at Kew, with green glass, of a tint selected by Mr. Hunt himself." In the *Theory of Horticulture*, it is stated, that "when a leaf is exposed to the direct influence of the sun, it gives off oxygen by decomposing the carbonic acid; whereupon the carbon remains behind, in the interior of the leaf, in a solid state. In the total absence of solar light, there is little or no extrication of gaseous matter; and what little is given off will be found to be carbonic acid, which plants exhale at all times in small quantities: oxygen, however, which was before expelled, is inhaled. Hence plants decompose carbonic acid during the day, and acquire it again during the night; and during the healthy state of a plant, the decomposition of this gaseous matter by day, and its recovery by night, is perpetually going on. The quantity of carbonic acid decomposed is in proportion to the *intensity of light* which strikes a leaf, the smallest amount being in shady places; and the healthfulness of a plant is, *cæteris paribus*, in proportion to the quantity of carbonic acid decomposed; therefore, the *healthiness of a plant should be in proportion to the quantity of light it receives by day.*" In times when the science of horticulture was less advanced, no great degree of attention was paid to the form of the roofs of those houses in which plants were artificially raised. Now, however, the minutest circumstances enter into the calculations of the scientific gardener. That the greatest possible influx of light might be secured, Sir George Mackenzie proposed hot-houses with curvilinear roofs; for he thought that "if we could find a form for a glass roof, such that the sun's rays should be perpendicular to *some part of it*, not on two days, but during the whole year, that form would be the best." Such a form is the sphere; accordingly, this shape of structure has been, by some, warmly advocated. But, however this may have been, the span and ridge-and-furrow roofs are now the prevailing forms; and any form is better than that of the lean-to, both for the convenience of internal arrangement as well as effect.

As the natural element of plants is the open atmosphere, where they are constantly surrounded with air in a state of continual motion, to arrive as nearly as possible at the circumstances of their natural conditions in the climates to which they belong, ought to be the aim of the gardener. "The atmosphere is the proper pasture of plants," says Dr. Lindley; "and its ever-varying density is a natural phenomenon, most intimately con-

nected with the maintenance of vegetable health. It is a beautiful compensation for their want of locomotion; as plants cannot move to the atmosphere, the atmosphere is ever moving towards them. It is therefore certain, without inquiring into the exact philosophy of the matter, that free access of abundant air must be secured if the health of plants in glass-houses is to equal that in the open air." To remedy the defects felt to exist in the former modes of ventilation, what is termed aëration, or subterranean ventilation, has now been adopted. The mode in which this is effected is by introducing supplies of fresh air through tubes or drains, placed at a distance of several feet under the surface of the borders, and having one end opening into the open air, while the other opens through various parts of the floor or border, and often, very properly, under the hot-water pipes. By this means fresh air is admitted, at almost the same temperature as that of the air close to the front of the house, and also charged with the moisture which it receives in passing through the damp pipes or drains. As plants, like animals, cannot long exist without their necessary supply of air, whether by night or by day, when it is admitted in this manner, it may often be allowed to act beneficially during the hours of natural darkness, as well as those of natural light.

THE VINERY.

The vinery admits of almost every variety of structural form; for, of all the fruit trees cultivated under glass, the vine is the one which entails the least trouble upon its growers. If the design be to bring the crop to maturity chiefly by the natural heat of the sun, or by this alone, then the vinery may have any form, provided the trees are trained near the glass. If the crop is designed to ripen in July, it is recommended by Knight that the roof be at an angle of 35°; but both Miller and Wilkinson recommend an angle of 45°, which is the slope most generally adopted for both grapes and peaches. The angle of inclination in glass-work is not, however, of the very highest importance. Abercrombie says that the diagonal side of a glass case, designed for a short periodical course of forcing, beginning on the 21st of December, may be 55°; 22nd of January, 50°; 21st of February, 46°; 21st of March, 43°. If the front and back wall of a vinery have shutters for ventilation, its roof may be fixed. The common trellis is as good as any for training vines.

In reference to the pruning and training of the vine, every horticulturist of eminence entertains an opinion of his own. It would, therefore, be the next thing to an impossibility for us to recapitulate even the half of what has been written upon this subject. M'Phail, however, says, that "to have good crops of grapes, much more depends on the soil they are planted in, and the climate in which they are kept, than on any methods of pruning and training that have been, or ever can be adopted." Mr. Loudon coincides with this remark; but, according to a high authority, the great object is "the reproduction of bearing; that is, annual wood over every portion of the house. When this is accomplished, the next matter to be determined is the number of eyes or buds to be left on each shoot; that is, whether we shall adopt the *short* or the *long* system of pruning. The former is most allied to the practice of foreign vineyards, and has been most successfully employed in this country. According to this system all the lateral shoots are cut down to single eyes. The other it is unnecessary to describe." In estimating the merits of the different modes, however, Mr. Lindley says—"As the ultimate object of every method of pruning and training must be supposed to be the obtaining a large crop of good fruit, it is material to consider how and by what means this is to be effected; and whether it is desirable to grow a large number of bunches or a number of large bunches; the weight of the whole of each being the same. I have myself ever been an advocate for large fruit, or the largest size to which any particular fruit usually attains; being fully satisfied that the value of fruit is more to be estimated by its individual bulk or weight, than by the number of individuals composing that weight. I may illustrate this by taking, for example, any variety of either the grape or of any other fruit. For example, let the Muscat of Alexandria, the Black Hamburgh, or, indeed, any other sort, be selected, and compare fifty single berries, of the largest size, with a bun-

dred smaller ones, making the same aggregate weight, equally in a state of maturity, the preponderance in the scale of merit will be given, I apprehend, by all competent judges, to the fifty berries instead of the hundred. If, then, we are to consider the maximum of merit to consist in the attainment of the largest-sized fruit, this can be best accomplished by having the vine in a vigorous and flourishing state." This condition is, according to this eminent man, to be attained, provided all other circumstances are favourable, by the alternate system of fruiting one shoot every year, to be cut down at the winter pruning, for the purpose of furnishing a shoot to succeed it in the following year. This is neither more nor less than what McPhail denominates the long or new method of pruning, and what Mr. Speechly called the alternate system. Mr. Loudon agrees with the system advocated by Mr. Lindley.

As to the soil for a vinery, it is recommended that the front border should be fresh and rich. It should not exceed 2½ feet in depth, and should be laid over a vaulted foundation, or one rendered perfectly dry by drainage; and all borders of forcing-houses should be elevated in height equal to their depth above the general ground-level. The soil, however, is not of such importance as the obtaining of a dry bottom, which may be secured by using the following ingredients:— One-half of good loamy soil with its turf, one quarter of rich old dung, and one quarter of brick and lime rubbish; the turf well rotted, and the whole well mixed. Plants raised from eyes, and prepared for two years in pots, are preferable for a vinery; and when planted inside the house, there ought not to be fewer than two plants to each four feet of space.

In forcing grapes, the kinds should be assorted according to the order in which they ripen. Thus the Muscadines, Chasselas Musqué, and Hamburghs, should be planted in a house by themselves, as being the first or earliest in order; the Frontignans, being of a medium character, may occupy a second; while the Tokay, the Muscat of Alexandria, Nice, Syrian, Barbarossa, and others would be suitable for a third. These, if planted in order, will succeed each other, and keep the table well supplied.

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THE PEACH-HOUSE.

Peach-houses, constructed in what is known as the *lean-to* form, and intended to be heated by one furnace, have usually the dimensions of forty feet in length, ten or twelve in width, and a height of forty feet. These, however, may be considerably varied, according to the time at which the crop is desired to be brought into season. For early forcing, it has been suggested that twenty-five or thirty feet in length, and seven or eight in breadth, are sufficient; whilst a house in which the operations of nature are only to be slightly assisted, may be extended to fifty feet. For peaches, as for vines, the span-and-ridge and furrowed roofed buildings are equally adapted, as in them the trees can be treated as standards, which is their natural habit. Besides, the fruit obtains a more favourable position, in so far as respects air and light, than it can obtain under any other form of house-training.

In the forcing-house, the pruning and training of peach trees does not materially differ from the practice followed in the open air. "Fire-heat is commonly applied about the beginning or middle of February; but where there is a large suite of houses, and an extended succession is wanted, forcing, as it then truly becomes, may begin a month sooner. At first the temperature is kept at 45°; but it is afterwards gradually increased to 50° or 55° Fahrenheit. While the trees are in flower, and till the fruit be set, the house is occasionally steamed by sprinkling water on the warm pipes; but, much better, by placing shallow troughs of water so as partly to surround the lower or returning pipe, the lower pipes being less heated than the upper ones. After this period the foliage is washed, from time to time, with the garden engine. When the fruit has stoned, or the kernels have been formed, the temperature is raised to about 60°." Water is then plentifully supplied to the border, the fruit thinned out, the different operations of disbudding and tying are performed, and air admitted in abundance. After the end of April little fire is required for the peach-house.

The best soils for fruit trees, generally, are such as are open and well drained, in order that the air may get freely into the roots.

Loamy soils are generally preferred for peaches, nectarines, apples, and pears; but light gravelly or sandy soils are suitable for figs and apricots. Dr. Lindley says that the reason chopped turf forms the best of all soils for fruit trees, is, that the "roots penetrate the soil in all directions, forming myriads of fine tubes, which convey air and moisture through the whole mass of earth." The best soil for peaches and nectarines is the turf from the loamy soil of an old sheep-walk, or fine pasture field, pared off about three inches thick, and roughly chopped. The fresher it is used the better.

The sorts recommended as the best for forcing, are—Gross Mignonne, Royal George, Royal Charlotte, Red Magdalen, and Bellegarde.

NECTARINES.—Ebruge, Violet, and Hâtive.

THE FIG-HOUSE.

For the forcing of figs alone houses are but rarely built, as in most families there is no great demand for this fruit; and, perhaps, because figs are generally forced in flues or tubes in the peach or cherry-house, and managed in the same manner as the trees of these houses are.

THE CHERRY-HOUSE.

The cherry is amongst the most difficult of all fruits to force. This arises from its blossoms being apt to fall off before the fruit is set, and also from the fruit itself frequently falling off before it has attained to the size of a pea. The period of commencing to force the cherry is sometimes in December, but more generally in January or February. Newly-planted trees, says Nicol, will bear gentle forcing next spring, from the first or middle of March, which ought to be considered merely as preparatory to forcing them fully from about the 1st of February the third year. As cherry trees are trained against the back wall, the house should be narrow, and the roof steep. When the fruit is setting, the temperature is kept, as steadily as possible, at 50°; but after it is set, a plentiful supply of water should be given to both their roots and foliage. When the fruit is colouring, water is almost entirely withheld, and air freely admitted. During the whole process of forcing cherries, an excessive heat from the rays of the sun must be prevented, either by shading or a due admission of air. In the cherry-house the plum and the apricot may have a place, as their treatment is almost identical.

THE PINERY.

The pine-apple being a native of the tropics, naturally requires, in this country, all the light which our cloudy climate can afford it. It is rarely propagated by seed, but frequently by crowns, which grow on the top of the fruit; though oftener by suckers, which rise from the stem. The following may be taken as a choice list for propagation:—

Enville, Black Antigua, Old Jamaica, Globe, Russian Globe, Montserrat, Queen, Moscow Queen, Antigua Queen, Ripley's Queen, Smooth Queen, Prickly Cayenne, Smooth Cayenne, Providence, and Prince Albert.

Formerly it took about three years to bring the fruit of the pine to perfection in this country; but on the system of training practised now, that period is reduced to much less than one-half. In regard to the rearing of this luscious fruit, it would appear that it is only to be brought to its highest state of perfection by being grown in low pits, just sufficient for the full development of the foliage of the crown and the fruit. "So closely is this adhered to by Mr. Fleming, of Trentham, one of our most successful cultivators, that he has had occasion to take out a pane of glass to allow the crown of the fruit to protrude into the open air. A passage along the centre of such pits is exceedingly useful, particularly in the fruiting department." In order to obtain sufficient warmth for these plants, the pots in which they are placed are usually buried in a bed of tanner's bark, decaying leaves, or other kinds of fermenting matter. This *bottom-heat*, as it is called, is somewhat difficult to be properly managed; and it would appear to have been, by gardeners, universally kept at too great a height. "Perhaps the upper limit of its temperature may be fixed at blood-heat, or, at most, 100°, while the richer or winter limit may be brought down to 70° or 75°. The principles of the application of bottom-heat have, until lately, been little understood. In practice its value has been acknowledged for

ages, having been an element in Roman gardening in the days of Claudius. The roots of fruit trees, even of the hardiest description, become paralysed whenever they descend too deep into the soil; and this paralysis is one of the evils of deep planting." Although pine-apples have been usually potted, it is found that they succeed better unpotted, if planted freely in soil, and exposed to a *proper amount of bottom-heat.* In the *Theory of Horticulture*, we are told that a Mr. Martin Call, one of the emperor's gardeners at St. Petersburg, was the first to assert this; and others have since proved it. In 1830, a pine-apple obtained by this treatment, weighing 9 lbs. 4 oz., was sent to the King of England by Mr. Edwards, of Rheola; and, in modern practice, all great pine-growers adopt this plan when circumstances permit them to do so. The following summary, by Mr. Lindley, in reference to the culture of this fruit, will serve to complete our notice of it:—"One of the best methods, without entering into any lengthened detail of operations, seems to be that which has been recommended by Mr. Sweet; which is, to pot the young plants in a mixture of one-third loam, and two-thirds of half-decayed leaves; in which they root very freely. They may then be plunged in frames, or a stove; but not in too much bottom-heat, as that will injure their roots, as is often done by those who expect to force them on by bottom-heat; and who, by that means, kill their plants, or injure them so much that they never perfectly recover. They do not consider that giving plants a strong bottom is working against nature; for, in their native climate, it is the sun that warms the ground in which they grow; and this heat should not be exceeded here."

THE MELONRY.

The melon has long been cultivated in Britain; but its original country is not thoroughly ascertained, neither is the period of its introduction into this island. The plant is a tender annual, demanding considerable attention and skill to bring to perfection, although it repays the labour of the horticulturist, by showing a large, and, to most persons, by being an agreeable fruit. The water-melon is seldom reared in this country, save as a curiosity; but the following species may be taken as a list somewhat select:—The Beachwood; Trentham high-bred, green-fleshed; Cuthill's Early Cantalousse, remarkable for its earliness and hardiness; Broomham-hall; Green-fleshed Egyptian; Cassabar; Sweet Melon of Ispahan; and Green Valencia. The melon succeeds best in a strong rich soil, in a prepared compost, formed of two-thirds of rotted turf, and one-third of old cow-dung. This should be prepared some months before being used in the melon-bed. The average heat required for the successful growth of melons is about 70° Fahrenheit. In the common hot-bed, this is maintained by protecting it during the night, and by applying linings from time to time. In pits or houses heated by the circulation of hot water, this is easily effected at any season; and such pits are said to supersede the hot-bed frame altogether.

THE CUCUMBER.

This, like the melon, is a tender annual, which, in order to bring it to perfection, requires the assistance of artificial heat. It also requires great care and attention, although it is somewhat hardier than the melon, and in summer requires less heat. In every other respect, however, it is managed precisely in the same way as the other. The leading varieties are—the Victory of Bath, Tilly's Captivation, Cuthill's Black Spine, Hunter's Prolific, Lord Kenyon's Favourite, Sir Colin Campbell, Canrobert, Snow's Prize, Allen's Victory of Suffolk, Duncan's Victory, and several others; but, like the melon, they run into endless varieties if grown in the same structure. The prickly sorts of cucumbers are, in the summer months of the year, frequently raised under hand-glasses. To do this, a cavity is made in a border in front of a wall or rather warm place, and is filled with hot dung. This is covered with earth, and two or three plants are put into it, and sheltered with a hand-glass. They are, from time to time, watered and dressed; and by this means a sufficient supply of small cucumbers, or gherkins, is obtained for pickling. In the southern counties of England, pickling cucumbers are easily raised without any artificial heat, being sown in drills in the open ground.

CHAPTER VIII.

ANGELICA; ARTICHOKE (JERUSALEM); ARTICHOKE (GLOBE); ASPARAGUS; BROCCOLI; BEET; BEANS (CLIMBING); BEANS (BROAD); BEANS (FRENCH); BRUSSELS SPROUTS; CABBAGE; CARDOON; CARROT; CAULIFLOWER; CELERY; CELERIAC; CHERVIL, ETC.; CRESS; CRESS (AMERICAN); CRESS (NORMANDY); CRESS (INDIAN); ENDIVE; ESCHALOT; GARLIC; ICE PLANT; LEEK; LETTUCE; MALLOW (CURLED); MARJORAM (KNOTTED); MELON; MUSHROOMS; ONIONS; PARSLEY; PARSNEP; PEAS; POTATOES; RHUBARB; SAVOY; SEA-KALE; SPINACH; TURNIPS; VEGETABLE MARROW.

ANGELICA.

In treating of the plants of the kitchen garden, we shall adopt an alphabetical arrangement, as being simpler than that which would bring them before the reader in the order of their importance. Accordingly, the first is Angelica, a biennial, and a native of England, where it is found in moist situations, as it is over the northern countries of Europe. It grows freely in any soil and exposure. It should be sown in September, in drills a foot apart. When the seedlings have attained to a height of six inches, they should be transplanted to the spot where they are to remain for use. The stem may be blanched and eaten like celery; and the young green shoots may be gathered in May, candied or preserved in sugar, and used in confectionery.

ARTICHOKE (JERUSALEM).

This is a perennial, which flowers in August or September. It is a native of the south of Europe, and, in 1848, was introduced into England. The three varieties cultivated, are the *Conical*, French or oval Artichoke, with a green head; the *Globe*, or largest, with dusky-purplish head; and the *Dwarfish Globe*. It will grow in any soil in which the potato will grow; but light, friable, and loamy soils will always produce the best-flavoured tubers. It is useless, however, to plant on poor barren land. Trenching, to the depth of two feet, should be done, and a good dressing of manure given, if a fine crop is desired. Plant in rows, alternately two and four feet apart, allowing the tubers to be at least eighteen inches apart in the row, which should run north and south, so that the sun may shine freely on the soil. The tubers should be planted whole, any time from November until March. The former, however, is preferable, on various accounts. This root may be grown for years upon the same spot of ground, and the produce increased, provided the soil be annually well trenched, and afterwards kept loose and open by thorough surface-stirring.

ARTICHOKE (GLOBE).

About the last week in October this vegetable should receive its winter dressing, and its old leaves should be cut away close to the ground. This must be done without giving any injury to the centre or side shoots. The bed should then be forked over, the earth being thrown in a ridge about eight inches high over each row, at the same time putting it close round each plant, but taking care to preserve the heart from being touched by any crumbs of the soil. This accomplished, pile round each plant with some long litter or pea-haulm, four inches thick; and to prevent this from being carried away by the wind, as well as to help to preserve the roots from severe frosts, the litter should be covered over with coal ashes, to a depth of about two inches. In the spring the ashes may be turned into the soil, as they are congenial to the artichoke. Should the land be stiff and clayey, trench it to a depth of eighteen inches, filling in with a mixture of dung and mould; and in April plant out in this mixture. A plantation will last many years.

ASPARAGUS.

This perennial is found near the sea, in stony or gravelly situations; but it is not very common in such places. It grows in the Isle of Portland, near Bristol, and, not very abundantly, near Edinburgh. For growing first-class asparagus, the following plan is recommended by Mr. Arthur Henderson. After

having selected a piece of ground that has been well trenched, manured, and, for years, worked about for other crops, apply all the manure that can be got in the shape of decayed vegetables, and good, sweet, rotten dung. Then trench the ground three feet deep, and fork up the sub-soil. This should be done in February, allowing the ground to remain until the young plants (one or two years' seedlings) have grown an inch, which will be the best time for planting. The rows should be six feet apart, and the seed sown four inches apart in each row. Where the ground is wet and damp, and no expense spared to have the best grass that can be raised, "it is advisable to have a drain right under each row, of any rough material; and a very efficient one can be made with bundles of rough stakes (not brushwood), which lasts ten or fifteen years. The finest asparagus has been raised in this way." To have asparagus in fine condition, the third season after planting, a few may be cut for use, but not too many; and all through the summer the berries should be gathered as they make their appearance.

BROCCOLI.

Mr. Loudon tells us that, in the time of Miller, the few broccolis then known were supposed to have come from the cauliflower, which was originally imported from the Isle of Cyprus, about the middle of the sixteenth century. Miller speaks of the white and purple broccoli coming from Italy; and it is supposed that from these two sorts all the subsequent kinds have sprung, either by accident or intentional impregnations. To cultivate this plant successfully, it requires a deep, rich, and somewhat adhesive soil. The ground should be kept clean, and all weeds kept down. As broccoli is often cut off by the frost, as many as possible should be planted in sheltered situations. Mr. Henderson says that the following is an excellent plan for growing first-class broccoli:—"Prick them out from the seed-bed nine inches apart in July, choosing strong sturdy plants, discarding all that are doubtful. Let the bed or border be well prepared with plenty of manure. To get them strong and vigorous plants before they are finally planted on a dry clay, mark, with a spade or dibber, one yard away from their destined places. Take out the mould from each successive place, one foot wide and one foot deep; pass it through a coarse sieve, adding a teaspoonful of guano, or a cupful of horse-dung. The refuse clods or stones should be put in the bottom of the hole, well broken up; press the earth down firmly with the foot, and then plant the above sturdy, stout plants from the bed or border, taking up with each plant plenty of ball and earth. It is an excellent plan, in hot, dry weather, which often prevails when the Cape broccoli is put in the ground, to sow the seed thinly in drills, where a portion can be taken out, and the remainder left for the crop."

BEET.

Red Beet is a biennial, and a native of the sea-coast of the south of Europe. The white beet is also a biennial, and is a native of the sea-coasts of Spain and Portugal, and was introduced into this country in 1570. The sea-beet is a native of the shores of Britain, but is not common. The field-beet, or mangold-wurzel, is supposed to be a hybrid between the red and white species of beet. This root is best grown in a deep and somewhat sandy soil. For salad beets no manure need be used, as it is not requisite to have them large. Ground well pulverised, with plenty of the manure of former years, well worked and trenched three feet deep, is what this root likes. For early use, a little should be sown in the middle of February; but for general use, sowing should be done about the middle of May, twelve inches from row to row, and finally thinned out to about eight inches. When the crop is taken up, store it in a cool dry shed, covering it over with straw, after it has thoroughly dried, among dry sand.

BEANS (CLIMBING).

The climbing section of beans are natives of South America; and of late years there have been some valuable additions made to this class, excelling, both in tenderness and prolificness, the French beans, and even the Scarlet Runners. None of this section should be sown before the 10th of June, being strictly late summer and autumn kinds: notwithstanding, their growth is so rapid, and they

are so delicate and tender eating, that they demand a snug, warm, and sheltered situation in every garden, however small.

BEANS (BROAD).

For these the ground should be trenched to a depth of two feet, with some good manure added through the top spit. If sown in rows parallel to each other, the rows (single) should be about three feet apart, and the beans six in the row, the large Windsor kinds requiring more room. As soon as a crop is insured, it is a good practice to pinch off the tops. This makes the pods swell better, and impedes the ravages of the dolphin fly, to which this family is peculiarly liable; it also concentrates the sap, and brings them forward a week earlier. Marshall's Dwarf Prolific is excellent for early work; and the Mazagan, though not so productive, is valuable because of its hardiness and early growth.

BEANS (FRENCH).

For the cultivation of this valuable and wholesome vegetable, choose a warm, snug border, taking care to earth them up in good time, in order to prevent the wind from breaking them. The hoe must be liberally used, and also watering, should the weather be very dry. Single-row culture is recommended; but if another mode is adopted, the rows should be two feet and five inches apart between the plants. Regarding the time of sowing, about the first week in May, in the open garden, is the best; and should the weather look suspicious, lend them a slight protection. One of the most prolific and finest flavoured sorts for forcing is the Yellow Canterbury, or Golden Dun; and, for sowing out-of-doors, the White Battersea is excellent. It should be placed in a warm, snug situation. Fulmer's Sion House, Newington Wonder, and the Early Battersea, are the best for forcing.

BRUSSELS SPROUTS.

This is one of the most valuable winter greens, and ranks also among the hardiest of vegetables. The seed should be sown in the middle of March, and again about the 15th of April. If sown in May, which is a very general and a very wrong custom, it is impossible for the plants to become tall and stout.

CABBAGE.

The common garden cabbage is too well known, and too universally used, to require any description here. In British gardens, by proper culture, it produces, from May to November, firm, compact heads, glaucous, green, or greenish-yellow externally, but blanched within; and varying, in different sorts, from three to twelve or fifteen inches diameter, and from two to fifteen or twenty pounds' weight. Its sub-varieties are numerous.

CARDOON.

This is a perennial, and a native of the south of France and Spain. It closely resembles the artichoke, but is larger. It prospers in a light deep soil. The seed is sown annually, about the middle of May, in shallow trenches, like those for celery, and the plants are thinned out to ten or twelve inches from each other in the lines. During severe frosts, the tops of the leaves should be defended with straw or litter.

CARROT.

The best varieties of this root are the Early Horn and the Long Horn; the former for early, the latter for general cultivation. The Altringham is also a good garden sort. The Carrot delights in a light, deep, fresh soil, in which it may be free to push down its long spindle-shaped roots. On a bed moderately hot a few Early Horn carrots may be sown in February; and, in the beginning of March, the same sort may be sown in the open air. The other sorts may follow in April, as a general crop. The carrot succeeds best in drills. After sowing, it is only necessary to thin the plants, and keep them clear of weeds. They are stored in winter, after the manner in which turnips are done.

CAULIFLOWER.

This variety of the cabbage tribe is cultivated for the sake of the flower-buds, which form a large dense head, and yields one of the most delicate products of the kitchen garden. The sowing, for the first or spring crop, takes

place in the latter half of the month of August; and, in the vicinity of London, the growers adhere, as nearly as possible, to the 21st of that month. A second sowing takes place in February, on a slight hot-bed; and a third in April or May. As the cauliflower is a tender plant, when young, it requires protection in winter. A good method is to plant them thickly in the ground, under a common hot-bed frame, and to secure them from cold by coverings, and from damp by giving air in mild weather. A rich soil, and a warm situation, are the best conditions for growing cauliflower, of which the varieties are—Early London, White, London Particular, Early Dutch, Large Asiatic, Walcheren, and Wait's Alma.

CELERY.

This plant, a native biennial, and inhabitant of ditches near the sea, is usually sown at three different times: on a hot-bed in the beginning of March, and in the open ground in March; and again in April. The seedlings, when about two inches high, are pricked into rich soil, in which they are allowed to stand till they have increased to four or five inches. The first crop is defended by frames, or hand-glasses, and is planted wide, to admit of being lifted with balls of earth adhering to the roots. As the plants advance in growth, earth is laid up about the stalks of the leaves—an operation which is repeated at the end of every ten or fifteen days, care being taken not to choke the plants. As the celery approaches maturity, scarcely anything but the tips of the leaves appear above the ridges; and, when lifted, the stalks are found to be completely blanched. Successional crops should be planted out from the 1st of June till the 1st of August, in a rich light soil, where there is plenty of moisture, in which this plant delights. The varieties are—Cole's Superb Red, Cole's Superb White, Lion's Paw, Seymour's White Champion, Nutt's Champion, Manchester Giant Red, Cole's Crystal White, Wall's White, and Cole's Dwarf Red.

CELERIAC.

This plant resembles celery in its flavour, and is, at first, treated like the early crop of that salad. In the beginning, or middle of June, it is planted out in a flat bed, in drills fifteen inches apart. Afterwards, a single earthing suffices. Its roots are used in soups; but it is not so much a favourite in Britain as it is in France and the Low Countries.

CHERVIL, AND OTHER PLANTS.

The chervil, Lamb's lettuce, marigold, and borage, are all used either as salads or in cooking, and may be sown in spring or in summer, in any light, fresh soils. The common sorrel the French sorrel, and the horseradish a. perennials, and are increased by parting their roots. They succeed best in any cool, shady situation. The capsicum, or chili, and the love-apple, are tender annuals, from tropical climates. Both are sown in hot-beds in spring; and after being transplanted, and nursed in separate pots, are planted out—the former in a warm border, and the latter against a wall. Dill has, for a long time, been cultivated in our gardens, though not extensively. It is easily raised from seed. Fennel is a beautiful perennial, used in salads and sauces. It may be propagated either by parting the roots or by seeds, which should be sown in autumn, soon after they are ripe.

CRESS.

The common or curled cress may be sown in shallow drills, a little successively every week, in spring, summer, and autumn, by those who prefer it cut in the seed-leaf; but if it is not cut till in the fourth or fifth leaf, as many prefer it, one sowing will last many weeks, provided the outside leaves only are picked off. In winter it may be sown in pots kept in a window, or on moistened sponge or flannel. As it is not required to produce large or strong plants, air may be wholly dispensed with. Heat, darkness, and moisture alone are necessary to make it germinate. It should be always sown on the surface of the soil, and not covered with it; for the more rapidly it is grown, the more tender will be the crop.

CRESS (AMERICAN).

This is a very good autumn, winter, and early spring salad, in use from September till May. It is an excellent substitute for watercress, and may be cultivated in any corner of

the garden. The best time to sow it is in the first week of July.

CRESS (NORMANDY).

A hardy variety, succeeding well in the open air. If sown in a sheltered situation, about the beginning of September, it will produce leaves throughout the latter months of the autumn, the winter, and spring. Sow the seed thin, and keep the bed or edging well hoed up.

CRESS (INDIAN, OR NASTURTIUM).

This is a salad not much used in this country; but, when young, it is considered wholesome. Sow at intervals in heat, beginning as early as January, cutting it down in the same manner as Common Cress for use, or make use only of the tops. It soon sends out side-shoots, which produce many gatherings.

ENDIVE.

This is an annual, and a native of China, whence it was introduced to this country in 1548. It is the lettuce of winter, the blanched hearts being used for salads and soups. It prefers a very rich but light soil, and should be sown at various times, beginning in the middle of May, and sowing monthly afterwards; the last sowing for autumn and winter being made in the middle of July. Sometimes they are planted in drills, to facilitate the operation of blanching. The Batavian and the Curled are the most highly-marked varieties; and of these there are many sub-varieties.

THE ESCHALOT, OR SHALOT.

This plant is originally from Palestine, and is much used in cookery, for highly-flavoured soups and gravies. It is also sometimes put into pickles. There are two sorts—the Common, and the Russian, which is much larger, and less pungent. It is propagated by offsets, which are commonly planted in September or October.

GARLIC AND CHIVE.

This is a common ingredient in continental cookery, but is not much used in this country. A few rows are quite sufficient for domestic purposes. It is propagated by offsets from the roots or by the bulbels, which grow on the flower-stem. The *Chive* is also occasionally used as a salad and alliaceous seasoning. A single row may be planted as an edging; and it is easily increased by parting the roots in spring or autumn.

ICE PLANT.

As a garnisher for the table, this plant possesses great elegance, and is easily cultivated. The seed should be sown in heat, about the beginning of April, potting them off singly as the plants acquire strength. They should be hardened off, and planted out about the end of May.

LEEK.

The Leek is originally from Switzerland; but, in all probability, has been cultivated in this island for many centuries. It is sown in beds in spring; and in June or July planted out in rows, fifteen or eighteen inches apart, and six inches asunder between the rows. When the weather is moist it is beneficial merely to lay the plant into the hole made by the dibble, without closing the earth upon it, the stem being, by this means, encouraged to swell out and fill the hole, as well as getting blanched at the same time. The varieties are—the London Flag, Dutch Flag, Musselburgh, Erfurt, and Rouen. Of these, the Musselburgh is the most hardy plant.

LETTUCE.

The native country of this plant is not known. There are two principal varieties—the Cos, or upright, and the Cabbage Lettuce. Its sub-varieties are numerous; and among them the following may be named:—The White Cos, Cilicia, White Cabbage, Early Forcing Cos, Dutch Cabbage, Imperial Cabbage, Grand Admiral, Paris White Cos, Green Paris Cos, Brown Cos, Wait's White Cos, Malta Cabbage, Neapolitan Cabbage, Tennisball, Hardy Green Hammersmith, and Black-seeded Grotte. By proper care fresh lettuce may be had throughout the year. The first sowing is made in January, in some sheltered situation; or in February, on a gentle hot-

bed: the second in the beginning of March; and the third in April. For winter a sowing is made in August or September, and the plants are pricked out in October, along the bottom of walls, or under glazed frames.

MALLOW (CURLED).

This plant is a very hardy annual, and is used for garnishing, in the place of vine-leaves; but when the leaves of the vine can be obtained they are preferable. The plant grows to a height of about three feet, and flowers in common garden soil.

MARJORAM (KNOTTED).

The most suitable time for sowing marjoram is about the end of February, and during March. This should be done on a bottom-heat; and when up, it should be potted and gradually hardened off for planting out-of-doors, or forced for early use. When the demand for it is large, a portion of what is planted out-of-doors should be cut down before the flower-stems run to seed; and as soon as the ants begin to grow again, they should be taken up, potted, and placed in a pit or house, to cut as green marjoram during the winter. A light, deep, and friable soil is the best adapted for successfully growing of this plant.

MELON.

We have spoken of this fruit in the forcing garden; but those who take pleasure in trying experiments, may be informed that melons are to be cultivated out-of-doors with success. The points to be attended to, are a south-east aspect bed, raised one foot above the level of the ground, only allowing nine inches for the plants to grow in; below them, to have a good drainage of rough bushes, straw, leaves, or other similar material. Plant under hand-glasses, and continue the use of them for some weeks, depending, of course, on the congeniality of the season. The plants intended for this purpose should be brought up very hardy.

MUSHROOMS.

This is one of those fungi with which it is dangerous for the inexperienced to deal. Those who desire to study the artificial production of their spawn may cultivate them; but for all other ends they are better left alone. However, small spare spots under stages, platforms, or at the ends of houses, can always be found for making a flat little bed, two feet in thickness, of droppings; soiled, and defended by a mat, taking care to beat the bed well down. By this means abundance of mushrooms will be produced with very little trouble; but "excessive moisture," says one of the first gardeners, "is not only apt to destroy the spawn, but it debases the flavour of such fungi as are produced under it;" and such excess of moisture, he further observes, is supposed to render the "salutary sorts less, and to make the *unwholesome* kinds more *acrimonious*."

ONION.

This is one of the most precious inmates of the garden; and one sort differs far less from another than the degree of skill in different hands, or the degree of quality in different soils. "The best sort for keeping," says Mr. Paterson, "is the Strasburg; and, for a large crop, the white Spanish; the silver-skinned is beautiful, and the dwarf-grown of that sort are the handsomest for pickles. The Blood-red and James' Keeping are excellent for pungency, and for the quality, which the latter name implies. The soil cannot be too light, if it be rich with old manure, incorporated by digging about the end of autumn." It is advantageous in the course of winter, after the manure has become amalgamated with the soil, to ridge up the earth like potato drills, which, by pulverising and drying, prepares for early sowing. Drilling is greatly to be preferred to broadcast, as the former admits of the hoe, which not only promotes the growth of the crop, but saves the trouble of weeding. One or two ounces of seed may be sown in August for a spring and early summer crop. At a medium elevation the middle of August is the proper season; and, sooner or later, from the beginning to the end of the month, according as the locality is near to mountains or the level of the sea. Some, in any condition, will shoot; but, by pinching off the early buds, good-keeping bulbs may be secured. The potato onion is very hardy, very productive, and of mild quality—equally

so with the Spanish; and it comes into use earlier than any other sort. Plant in the middle of October: it is as well to give them a slight covering of litter in severe weather. There is a silver-skinned variety of this underground onion, very excellent, and equally prolific as the old sort.

PARSLEY.

Sow this plant in lines one foot apart, the first sowing being performed in the last week of March, and the second in the first week of June. The soil should be deep and rich; and the plants should be thinned out to six inches. As an edging to borders it is very suitable. Perhaps the best variety is Myatt's extra fine-curled, or the Enfield Market. The turnip-rooted parsley is treated in the same manner as the common parsley, sowing it in drills in the middle of April, and thinning out to four inches from plant to plant.

PARSNEP.

The parsnep agrees with a deep and rich, but not recently-manured soil. It may be sown in March, either in drills a foot apart, or broadcast. It should be thinned out to half a foot from plant to plant. As the parsnep is not injured by frost, it may be taken up as required, or the whole crop may be gathered in October, and pitted like potatoes. The Hollow Crown and Large Guernsey are the sorts most in use.

PEAS.

A deep, rich, and loamy soil is that in which the pea delights; but any ordinary garden soil, if dug deep, and well manured, will afford fair crops. Nothing is more idle than to study the almost endless varieties of peas; but we must recommend the following as among the best varieties:—The Champion of England, Mammoths, Knight's Marrow, Epps' Monarch, Ne Plus Ultra, British Queen, Bedman's Imperial, Auvergne, and Kingwood Marrow. Thurston's Reliance is also an excellent sort, superior in flavour, and keeping green much longer than the ordinary kinds.

POTATOES.

The management of this root is so well known that it supersedes the necessity of saying much about it here. We must, however, recommend the planting of early varieties, of which the crop is generally positively certain. The Ash-leaved Kidney is good eating, up, at least, to Christmas; and Martin's Early Globe is a sure cropper, ripe and ready for use just before the disease makes its appearance in this country. It also possesses the excellent property of always eating like a new potato, even as late as April and May. Autumn planting, say from the middle of October to the end of November, is recommended for general and main crops. It is advisable to use whole sets of tubers of a moderate size, putting charred wood-ashes in with each set. This acts beneficially. Earthing up early, and keeping the ground clear of weeds, are the chief duties to be attended to, never making use of any manure to the ground, or at planting time. Fresh broken-up ground usually produces very good crops, and mostly free from disease.

RHUBARB.

This root is excellent for tarts and pies in the early part of the season, before the gooseberry has made its appearance. To have a good supply, set a dozen or more cuttings of the roots, reserving to each a part of the crown or top, on deep rich ground, in rows four feet apart, and three feet distant in the row, taking care to have none less than a yard from the walk, or box edging. The best varieties are the Prince Albert (early), Randal's Prolific, and Myatt's Victoria.

THE SAVOY.

This vegetable delights in a deeply-trenched soil; and the best sorts are—Dwarf Green, Curled, Dark-Green Globe, and Yellow Curled, more delicate than the greens. The celebrated Ulm comes into use in the middle of August; but the earliest sorts can be sown the second week in March; again in the middle of April; and, lastly, in the first week of May. Plant two feet and a-half between row and row, and about twenty inches from plant to plant, with the Dwarf and Early Ulm just half the distance. There are few vegetable plants more generally relished than the Savoy, when properly cooked for the table.

SEA-KALE.

This fine esculent is little inferior to asparagus, and a great deal more abundant, with less cost. The ground prepared for it should be well manured, and trenched to a depth of three feet. It should also be forked up, and the bottom spit of the trench loosened. Sow the first week in April, thinly upon a bed in an open part of the garden, or in straight lines three feet asunder; the plants in each row to be eighteen inches apart. During August and September, or earlier, should the young plants be in a vigorous state, a little salt and soot, dissolved with manure water, may be applied once a fortnight. The following spring, about the beginning of April, take them up, carefully shortening the roots to seven inches. Then plant them out in deeply-trenched ground, as already stated, in rows four feet apart, and two feet from plant to plant, placing the crowns of the roots a couple of inches below the surface.

SPINACH.

This vegetable is not particular either as to soil or season; and it makes its appearance early in the spring, when there is no great abundance of culinary plants in the market. It is sown in shallow drills, with a width between each sufficient to allow the hoe to be worked. Sow in the latter end of March, and again in the middle of June, in order to ensure a succession of leaves, the size and succulency of which entirely depend on the richness and moisture of the soil. This is the only vegetable, in common use, that has the male and female flowers on different plants—a circumstance which gives no trouble in the raising of seed, as it is certain to happen, that, among a considerable number of plants, there will be some of both sexes.

THE TURNIP.

Mr. A. Henderson says, that turnips, to be tender and mild, must be grown rapidly, receiving no check of any kind from the day the seed is put into the ground. They delight in a generous, well-worked soil, abounding in manure, and thoroughly incorporated together—filled, in fact, with the vegetable manure of previous years. Under such circumstances the fly becomes unknown, and the flavour is delicious, the bulbs being tender and delicate. Perhaps the row system is the best for garden culture; and the distance between should vary from two to fifteen inches, and, in the row form, to six inches. Very clean culture, scarifying and stirring the ground, with early thinning, is requisite. The fly must be averted; and charred ashes, and chimney or charcoal-dust, used in the dry state, is quite a preventative for this pest. Sow Early Dutch in a sheltered situation in the middle of March; the Early Stone monthly, till July, when a good breadth of a hardy sort (say the Orange Jelly) should be put in for winter use. There is another excellent variety, called the Chick Castle Black Stone, for winter use; and, for this purpose, should be sown about the latter end of July, and middle of August. The American Strap Stone is also very superior in quality and flavour, being quick in growth, and very white and crisp.

VEGETABLE MARROW.

This is both a valuable and a profitable vegetable. The celebrated green, long-fruited variety, named Prince Albert, and the long white one, are the best in cultivation. It is better to sow the seed in a gentle hot-bed, or under cover, about the middle of April, when they have four rough leaves. Plant them in a rich soil, and in a warm and sheltered situation, about the third week in May, taking care, at first, to cover the plants over with an inverted flower-pot at night, or other similar contrivance. When hot dung is to be had, about four barrowfuls, buried in the ground, greatly assists them: the earth that is taken out ridge up round the plants. This will protect them; whilst the hot dung will be of great benefit in giving the young plants a vigorous start; after which they will require no extra care. In dry weather they require an abundance of water; and, at the least, once a week, a thorough good soaking of liquid manure, washed in afterwards with clear water—always applied in the evening.

The pumpkin and the squash are treated in the same manner as the vegetable marrow; but they are not so generally esteemed.

CHAPTER IX.

STYLE; BRITISH FLOWER GARDENS; SOIL; GRAVEL-WALKS; THE SHRUBBERY; MODES OF PROPAGATION; PERENNIAL PLANTS; BIENNIAL PLANTS; ANNUAL PLANTS; THE HYACINTH; TULIP; RANUNCULUS; ANEMONE; NARCISSUS; LILY; DAHLIA; OTHER FLORIST'S FLOWERS; CALENDAR.

STYLE.

THE great Condé, after spending half of the mature manhood of his life in war, strategy, politics, and intrigue, fell back upon the cultivation of a flower garden, as being the most delightful of all out-of-door amusements; and there are tens of thousands of men, who, although they have never had the chance of becoming Condés, pass much of their recreative hours in the tending of flowers. It is, therefore, not altogether, as some think, an occupation only suited to employ the leisure of ladies; although there is no fairer sight than to see a beautiful Proserpine trimming her flowers beneath the golden beams of an early spring or summer morning. The principles of gardening, however, are both vague and evanescent. "As flower gardens," says Mr. Loudon, "are objects of pleasure, the principle which must serve as a guide in laying them out, must be taste. Now, in flower gardens, as in other objects, there are different kinds of tastes. These, embodied, are called styles, or characters; and the great art of the designer is, having fixed on a style, to follow it out unmixed with other styles, or with any deviation which would interfere with the kind of taste or impression which that style is calculated to produce. Style, therefore, is the leading principle in laying out flower gardens, as utility is in laying out the culinary garden. As objects of fancy and taste, the styles of flower gardens are various. The modern style is a collection of irregular groups and masses, placed about the house as a medium, uniting it with the open lawn. The ancient geometric style, in place of irregular groups, employed symmetrical forms; in France, adding statues and fountains; in Holland, cut trees and grassy slopes; and in Italy, stone walls, walled terraces, and flights of steps. In some situations, these characteristics of parterres may, with propriety, be added to or used instead of the modern sort, especially in flat situations; such as are enclosed by high walls; in towns; or where the principal building or object is in a style of architecture which will not render these appendages incongruous. There are other characters of gardens, such as the Chinese, which are not widely different from the modern; the Indian, which consist chiefly of walks under shade, in square grass; the Turkish, which abound in shady retreats, boudoirs of roses and aromatic herbs; and the Spanish, which are distinguished by trellis-work and fountains: but these last gardens are not generally adapted to this climate; though, from contemplating and selecting what is beautiful or suitable in each, a style of decoration for the immediate vicinity of mansions, might be composed preferable to any one now in use."

BRITISH FLOWER GARDENS.

In Britain two varieties of flower gardens have principally prevailed; one in which the ground is composed of turf, and the pattern, so to speak, exhibits a variety of figures cut out on the turf, and planted with shrubs and flowers: the other when the flower beds are separated by walks, usually covered with gravel, without having any grass whatever. As a matter of course, situation should, in a great measure, determine which of these is to be chosen; but when the garden is to be viewed from the windows of the house, or any other elevated point from which the whole or a considerable portion of the design may be perceived at once, preference should be given to the former. Where the surface is irregular, and the situation more distant, and particularly if the flowers are to be taken as the primary objects of interest or admiration, the choice should be given to the latter. The situation of the flower garden must be governed by the nature of the lawns, and the site of the house or mansion to which it is attached. As to form, the flower garden

may take any shape; but if it is large, its boundaries ought not to be continuously visible.

SOIL.

The soil of a flower garden is one of the principal things to be attended to, as it should be varied in such a manner as to meet the requirements of the species of plants designed to be grown in it. For example, earth varying from boggy peat to pure sand, is required for American plants. The best sort is alluvial, or that kind of boggy earth which has been washed away and incorporated with white sand. Peat, cut from its natural bed, and only partially decomposed, is valueless, if not really prejudicial to plants. "In collecting soil from the surface of a moor," observes a practical writer on this subject, "it is proper to take no more than the upper turf or sod, with the peat adhering to it, and only from the driest parts of the ground, where, besides the common heath, fescue-grasses occur. When this cannot be procured, a good substitute is found in vegetable mould; that is, decayed leaves, swept from lawns or woods, and allowed to lie in heaps for a year or two. For the general purposes of the flower garden, a light loamy soil is advantageous; and where the natural covering is thin, or requires making up, recourse should be had to the surface-earth of old pastures, which, especially when incumbent on trap-rocks, is found to be excellent. It is expedient to have a large mass of this material in the compost yard. The turf, and the surface soil adhering to it, should be laid up in a rough state, in which way it is continually ameliorating by the decomposition of the vegetable matters, and the action of the air."

GRAVEL-WALKS.

The principal walks of a garden should never be made narrower than to admit of, at least, three persons walking abreast upon them. It is a very common practice to see gravel-walks so contracted as scarcely to admit of two persons walking arm-in-arm upon them. We would therefore recommend that, even in small gardens, a considerable breadth of walk should be given, not only for the sake of convenience and pleasure, but on account of the much better effect such an arrangement has upon those who contemplate the garden. As a great deal of the neatness of walks depends upon the material of which they consist, gravel from an inland pit is preferable to any other. In the neighbourhood of the sea-coast, this is, in some parts, to be obtained of very good quality; but the gravels of Blackheath and Kensington, in the vicinity of London, have been much celebrated for the beauty of their colours, and have been transported to various parts of the kingdom for the purpose of being applied to the walks of gardens. Where the walks are covered with gravel, hoeing and raking, from time to time, is necessary in summer, to destroy the weeds with which they are apt to be disfigured. After this, or even after they have only been swept, they should be rolled down with a hand-roller, and this repeated as often as the surface is ruffled. Nothing has a greater tendency to heighten the beauty of garden-walks than the operation of frequent rolling.

THE SHRUBBERY.

The beauty of a garden greatly depends on the choice which is made of its trees and shrubs, and the mode in which they are artificially disposed. Of the many excellent species of these with which Britain is now enriched, it would be impossible for us to speak, in the space to which we are limited. In this department of horticulture, we can therefore only mention a few; but these few will be introduced on the authority of one of the best practical gardeners of the present day. We will, as far as possible, avoid the Latin names. —Besides the Common and the Portugal Laurels, there are other evergreens which merit especial notice, as suitable to be disposed in large masses. Among these we may notice the American Arbor Vitæ, and the Chinese Arbor Vitæ, which last is well adapted for small compartments. The different varieties of Rhamnus Alaternus, and the species of Phillyra and Junipers, have long enjoyed favour in the eyes of the admirers of evergreens. "The Sweet Bay," says Mr. Mackintosh, "in favourite situations, rises into a handsome shrub or low tree, and may convey to the student of the classics, the idea of the Delphic

Laurel." Besides these there are the Strawberry tree, the Irish Yew, the Cypress, Larustinus, Swedish and Irish Junipers; different kinds of Daphne; the Andrachne, the Broad-leaved Myrtle; the Acuba Japonica, the Cistus and Helianthemum. Among the shrubs requiring a peaty or, at least, a moist and shady situation, are the Rhododendron, the Azelia, the Andromedas, and several others more recently introduced. Among these, some of the hardy heaths should find a place. Of deciduous flowering shrubs, there is not a finer object in the vegetable kingdom than the Flowering Lilac, which, from the deliciousness of its fragrance, and the pendent graces of its foliage, should always find a place in a garden. Of climbing shrubs, the Clematis and Honeysuckle may be first mentioned; but, independent of them, it may be observed, that there are numerous varieties of Fuchsia, Escallonia, and Ceanothus, which, when planted against a wall, or even in the open ground, and shaded, in winter, with an occasional covering, convey to us a better idea of the riches of Chilian vegetation, than when they are restricted to the shelves of the green-house. Many roses are also well adapted for walls, such as the varieties of Noisette, Boursault, and the different species from China.

MODE OF PROPAGATION.

"Nearly all shrubs may be propagated by layers; some by budding or grafting; many by separating the roots. In planting, shrubs may be arranged either singly or in masses. The latter method is the most efficient in the production of effect; but it should not be very servilely adhered to, as it is apt to beget monotony. Some kinds should never appear in masses; the white Portugal broom, for instance, when so arranged, gives a limy tint to a garden. Perhaps it is better that groups should contain a predominance of one shrub, set off by a few others of a contrasting figure or colour, than that they should be entirely homogeneous."

PERENNIAL PLANTS.

The principal plants employed for floral decoration are the common perennial flowers, whether strictly bulbous or herbaceous in their character. In planting these, they should be arranged according to their height, otherwise many of the most charming flowers of lower proportions will be entirely lost sight of. It is essential, therefore, that the lowest plants stand first, or next to the border or margin of the parterre—to be succeeded by the next highest, and so on backwards. The flower-pots should present a regular bank of foliage and blossom, ascending gradually from the front: "but as this might convey an idea of too great precision, a few *staring* plants, on the same principle as those employed in green-houses, should be thinly scattered over the surface." Most herbaceous or perennial plants are propagated by parting the roots, or by cuttings; but some, most conveniently, by the sowing of seed. For the names of those showy flowers best adapted to the British climate and garden, we must refer our readers to the catalogues of practical horticulturists and nurserymen.

BIENNIAL PLANTS.

Plants which have been designated biennials are such as have an existence only of two years, when they wither and decay. Many of them are invested with great beauty; and by the easiness with which they are propagated, and the rapidity of their growth, they furnish a ready means of ornamentation to garden borders. Where a very desirable variety is obtained, attention should be directed to the striking of cuttings during the summer, as the only way of continuing it. The end of spring is the proper time for sowing biennials, which is done in beds; and, in the course of the following autumn, they are generally transplanted into those places designed for them, and where they are intended to stand. The object of this is to enable them to get confirmed before the winter, that they may readily shoot into flower in the following summer.

ANNUAL PLANTS.

Annuals, besides being easy of culture, possess great beauty and elegance of form. All that is necessary to be done to have a crop, is only to throw the seeds into the bed or spot where they are wished to grow, and in due season they will make their appearance as plants, without care or trouble. They are

divided into three classes—the *hardy*, the *half-hardy*, and the *tender*. The first are sown at once in the ground assigned to them; the second, if wished to succeed well, should be, at first, assisted by a slight hot-bed, and then transplanted into the open air. The *tender* should be kept in pots, and cherished, as store or green-house plants, which is the treatment more properly belonging to them. It is hardly necessary to remark that the two former may be grown either in patches or in beds, and should be subjected to all the rules which apply to the disposition of common border flowers. Many new annuals have, within a few years, been introduced into this country; and doubtless, at no distant period, this will be the case with many more.

FLORISTS' FLOWERS

The flowers of the practical florist are, as might be expected, certain favourites to which that class of gardeners have devoted a large share of their attention. They comprise the Hyacinth, the Tulip, the Ranunculus, the Lily, Anemone, Narcissus, Dahlia, Auricula, Polyanthus, Carnation, and some others. We will devote a few remarks to each of these.

THE HYACINTH.

This flower is originally from the Levant, where it grows abundantly; and is possessed of great beauty, associated with a delightful perfume. In form, it bears some resemblance to the common harebell; and in the East it has long been a favourite. It is scarcely credible what an enthusiast in particular flowers will give for a single bulb of his favourite. The catalogues of the Haarlem florists were wont to enumerate 2,000 sorts of hyacinths, some of which have been bought at £200 per bulb. They have now, however, diminished in variety, as well as in price; and are either single, semi-double, or double. A perfect flower of this sort is thus described by Mr. Glenny, in his work on *The Properties of Flowers and Plants*:—"Each pip or flower should be round, and not ragged. The petals should be broad, thick, and round at the ends, not pointed, and reflex enough to throw up the centre well. The foot-stalk should be strong, and hold the flower out stiff in a vertical position, and by no means weak, to allow the pip to hang with the face sloping downwards. The foot-stalk should be of a length to make the pips touch, and no more. The pips should be large, and the flowers close on the stem. Double flowers should have the rows of petals above each other very regularly imbricated, so as to throw up the centre. The spike should be bold, round, compact, and pyramidal. The flower should be very strong, and diminishing to a single flower at top. The flower-stem should be very strong and upright, and no part of it should be seen, in consequence of the closeness of the pips to each other. The colours should be bright, clear, and dense, whatever the shade; and any better approach to scarlet, blue, or yellow, than those shades we now possess, would be highly esteemed."

The proper soil for the culture of the hyacinth is one that is rich, light, and sandy. The best compost is, perhaps, that used by the Dutch, which consists of one-third of coarse sea or river sand; one-third of rotten cowdung, without litter; and one third of leaf mould. The natural soil is removed to an extent of, at least, a couple of feet deep, and the vacant space is filled up with the compost, previously well mixed. It is said that these ingredients retain their nutritive properties for six or seven years, although the Dutch do not plant hyacinths in the same place two years successively. In the alternate years, they plant it with the crocus and narcissus. About the 25th of October is the best time to plant the bulbs.

THE TULIP.

This gorgeous flower is, also, a native of the East, and was introduced into Europe about the middle of the sixteenth century. The properties of a fine late tulip, as given by Mr. Glenny, are these:—"The cup should, when quite expanded, form from half to a third of a hollow ball. To do this the petals must be six in number; broad at the ends, smooth at the edges, and the divisions between the petals scarcely to show an indenture. The three inner petals should set close to the three outer ones, and all being so close as to show no openings between them. The petals should be smooth, thick, and stiff, and should keep their form well. The ground colour should be clear and distinct, whether white or

yellow. The least stain, even at the lower end of the petal, would render a tulip comparatively valueless. Whatever be the disposition of colours or marks upon a tulip, all the six petals should be marked alike; and be; therefore, perfectly uniform. The feathered flowers should have an even, close feathering, forming an unbroken edging all round. If the flower have any marking besides the feathering of the edge, it should be a beam or bold mark down the centre, but not to reach the bottom of the cup; the mark or beam must be similar in all the six petals. Flowers not feathered, and with flame only, must have no marks on the edges. None of the colour must break through to the edge. The colour of the petals should not descend too close to the bottom. The height should be from eighteen to thirty-six inches; the former being right for the outside row in a bed, and the latter for the centre or highest row."

The proper soil for tulips is similar to that suitable for hyacinths, and the season for planting the same.

THE RANUNCULUS.

This flower is from the Levant, where it is in great favour with the Turks. The existing varieties in this country are now mostly of British origin. The properties of a fine double ranunculus are, according to Glenny, the following:—"The flower should be the form of two-thirds of a ball, two inches in diameter, and the upper part of it square or horizontal. The outline of the bloom should form a perfect circle. The petals should be thick, smooth on the edges, and gently cupped; they should lie close, so that little but the edges should be seen. The flower should be symmetrical to the centre, which should be close, so as perfectly to conceal the seed-vessel. The colour should be very dense, whatever be its hue. If an edged flower, the edging should be well defined, and the marking even and uniform. In no case should the ground-colour break through the edging; but spotted flowers, with one spot on each petal, are allowable. The stem should be strong, and long enough to raise the flower clear six inches above the foliage. Striped flowers are not perfect, nor are flowers speckled at the edges."

The ranunculus requires a stronger and moister soil than most other flowers. It is generally sown in boxes, in the autumn or the spring; and no florist's flower is more readily propagated from seed.

THE ANEMONE.

This beauty of the flower garden comprises two species, called the Anemone Hortensis, from Italy, and the Anemone Coronaria, from the Levant. In a double specimen the stem should be erect, strong, and not less than nine inches high. The soil and culture are so similar to those of the ranunculus, that it is unnecessary to specify them.

THE NARCISSUS.

This is an extensive genus, which rather belongs to the botanico-florist than to the florist proper. The polyanthus narcissus gives the varieties principally cultivated by florists; and they succeed best in a rich, light soil, containing a little dung.

THE LILY

Of this flower there are numerous species; and the old White Lily, after furnishing the poets with so much imagery, has sunk into the humble station of a modest border flower. The Orange Lily, and the Lily Mortagan, may follow its example; but the Scarlet Turk's Cap is worthy of more care, as being more beautiful and more tender. The Tiger Lily—a splendid specimen—flourishes best in a peaty soil; and the same remark applies to the Lily Canadense and Superbam, both of which are magnificent specimens. In the Lily Japonicum and Longiflorum, the genus attains its greatest magnificence; but the climate of Britain is unfavourable to them out-of-doors. They must, therefore, be grown in pots under glass.

THE DAHLIA.

This splendid flower is a native of Mexico, and was, in 1789, introduced into this country, but was afterwards lost by our cultivators. There are two species, the Dahlia *Variabilis*, and the Dahlia *Coccinea;* but the varieties are endless. In 1804, it was re-introduced to this country, and the results have been very favourable to the flower garden, from the

magnificence of its appearance. The plant succeeds best in an open situation, and in rich, deep loam; but there is hardly any garden soil in which it will not thrive with manure. Dahlias, however, should not be repeatedly planted in the same spot; and they generally flower till checked in autumn by the frost. The roots are then taken up, dried, and stored in a cellar, or some other place, where they may be secured from frost and moisture. Old roots often throw up numerous stems, which render thinning necessary.

OTHER FLORISTS' FLOWERS.

It would lead us greatly into detail to speak fully upon Calceolaria, Chelone, Phlox, Pentestemon, Pansies, Roses, Cinararias, Lobelias, Verbenas, Chrysanthemums, Picotees, Hollyhocks, Fuchsia, Petunia, &c., notwithstanding all of them enter into the category of florists' flowers. We may observe, however, that the Auricula is a native of the Alps and the Caucasus; that the Polyanthus is supposed to be a seminal variety of Primula Vulgaris; that the Carnation is a native of Germany; and that the Pink is merely one of its varieties. These are all favourites of the garden; more especially the Carnation, not only on account of the delightful fragrance of its blossoms, but also for the beauty it possesses.

CALENDAR.

JANUARY.

Fruit Garden.—Open weather in autumn is the proper season for planting; but if it has not then been done, do it now, watching over the roots to protect them from any draughts which may occur in spring. All sorts of fruit trees should, in mild weather, be pruned; nailing only in fine weather. Any trees which may be infested with insects, should be washed with tobacco liquor, or with soapsuds and flower of sulphur.

Forcing Department.—Shrubs to be forced should be taken to the green-house or to a warm pit first, to prepare them, and their roots thoroughly soaked, as they are often very dry; see also that they are not heavily laden with flower-buds, and that they are in proper trim as to training, &c. Hard-wooded plants must have fire-heat during frosty weather; but it must not rise above 40° at night, and 50° by day. Soft-wooded plants may be kept growing freely, but not at high temperatures.

Kitchen Garden.—Sowing of peas, beans, two-bladed onions, collards, York cabbage, horn carrot, and parsneps, may, at any time, be made this month. There is, of course, a certain amount of risk in early sowing; but in mild and tolerably dry seasons, there is sufficient compensation for losses at other times in the earlier production or increased bulk and excellence of the crop. Rhubarb, in the open ground, may be forwarded by covering the crowns with sea-kale pots, or a lot of old boxes.

Flower Garden.—Evergreens should not now be planted, but deciduous trees may be, during open weather. It is a good time to make alterations, and to stack up turf, and mix composts. Tulips and hyacinths require protection from severe frost, but must be allowed as much air and exposure as possible. Those in beds, exposed to the morning sun, should be watered with cold water very early, when the foliage has been frozen in the night. Prepare beds for anemones and ranunculuses. Roses may be planted, and after planting, layed out on a heavy mulch of half-rotten dung.

FEBRUARY.

Fruit Garden.—Vines should be pruned, and laid in. This should be done only with the ripest of last year's shoots, at a distance of about eighteen inches from each other, and not more than four eyes in length. The walls should be cleared, and the plants nailed up firmly, making use of as narrow shreds as possible. Netting for espalier and wall trees should be prepared, and employed whenever the buds begin to swell, especially if north-west winds prevail. If strawberry beds be early formed this month, on rich firm ground, they are likely to bear well. Bush fruits should be planted and pruned. Grafting, if the weather be favourable, should be begun; and scions put into the earth in bunches, with a tally to each, will keep a month, if necessary, and take better than if put on as soon as cut.

Forcing Department.—Fire-heat may be used more liberally now; and cinerarias, primulas, and other soft-wooded, early bloom-

ing plants, placed as near the glass as possible. Abundance of water should be given to everything that is growing freely. Hard-wooded plants, that have been kept dry all the winter, very possibly need to be plunged to the rim of the pot in a vessel of tepid water, to soften the ball of earth, and allow water to pass through freely. Old plants of bedders should be started for cuttings; and these put in as soon as they can be taken, in order that the bedders may be brought forward in time to plant out strong. All store plants from boxes and cutting-pans should be potted off. Look to the under sides of the leaves of the cinerarias, calceolarias, pelargoniums, &c.; and, if any fly be there, put these together in a box and fumigate, or fill the house with smoke, and syringe next day. All hard-wooded plants coming into leaf should be freely syringed. Temp. 45° at night, 55° to 60 by day. Bottom-heat for cuttings, 60° to 70°.

Kitchen Garden. — Prepare immediately every inch of ground intended for summer crops. Where peas, beans, onions, cauliflowers, and broccoli are to be put in, the ground must be liberally manured and deeply stirred. Mark out the soil for onions into four-feet beds, and raise the beds six inches above the general level, leaving the surface rough. Choose, for potatoes, ground on which cabbage, broccoli, or celery has been grown, and which was well manured in the preceding year. Make up sloping borders under warm walls and fences, for early horn carrot, onion, radish, lettuce; and to prick out cauliflower and broccoli from seed-pans, &c. Plant, on dry ground, potatoes as soon as possible; sets should be of moderate size, and with short, stubby, hard sprouts upon them; when the sprouts are long and white, a sound and abundant crop can hardly be expected. Sow *in the open quarters*, peas, beans, parsneps, spinach, leeks. Sow *on warm slopes*, radish, hardy lettuce, cabbage, parsley. Plant potatoes, garlic, shalot, chives, onions for seed.

Flower Garden.—Deciduous trees should be planted without delay. Mixed borders forked over, where it can be done without fear of damaging pæonies, bulbs, &c.; but if these are not tallied, it will be better to leave the borders alone till the plants appear above ground. Walks, rockeries, edging, roseries, peat-beds, and lawns, may all be formed and planted this month; and the sooner the better. Herbaceous plants should, also, be parted and planted. Also ranunculuses and anemones. Sow hardy annuals in pans for planting out. Californian annuals, such as escholtzias, godetias, clarkias, candytufts, nemophilas, viscarias, &c., may be sown in the borders where they are desired to bloom.

March.

Fruit Garden.—Cuttings of bush fruits may still be planted, and grafting should not be delayed. Pruning and cleaning ought to have been completed some time ago. All the prunings and clippings of trees and hedges should be burned, and the ashes used as a top dressing for quarters of bush fruits. Mulch raspberries with half-rotten dung, and they should not be dug between. Plenty of manure should be laid down between strawberries.

Forcing Department.—There must now be no delay in shifting on all subjects that require increased root-room, for vegetation is fast becoming active; and if plants make new roots in old exhausted soil, their vigour and their beauty are both deteriorated. Pot gladioli, liliums, Cape bulbs; shift ericas; start fuchsias, and take cuttings. Camellias, which are done flowering, should be started into growth in a moist atmosphere and genial temperature. Plenty of water should be given, alternating with liquid manure, to cinerarias, calceolarias, pelargoniums, and other subjects advancing into bloom. Temp. 50° night, 60° to 65° day.

Kitchen Garden.—The plots to be sown or planted this month and next, should be manured, and the ground dug pretty deep, and left rough. Should the soil be well drained, the principal crop of potatoes may be planted at once; but if the soil is damp, it will be better to wait till next month. Plant horseradish in any spare corner, digging the ground pretty deep, manuring the sub-soil, that the roots may come finer. Onion-beds should be marked out, and the soil liberally manured. Prepare for all crops that are to succeed each other, so as to have the ground well sweetened in time to receive them. Sow turnip, long radish, main crop of parsneps,

broccoli, savoy, cabbage, cauliflower, horn carrot, main crop of onions, parsley, leeks, beans, peas, lettuce, spinach, and small salads.

Flower Garden.—Herbaceous plants for summer and autumn bloom can now be planted, though it is always better to do so in autumn. Hardy annuals in the borders should be sown, and tallied to each patch: as soon as large enough to handle, thin the patches, and plant out the thinnings wherever necessary, or pot them for blooming in the window. Strike chrysanthemums in heat, for planting out in May. Set dahlias, and take cuttings. Give sufficient air to carnations, pansies, auriculas, &c.; and water freely during bright weather. Weak liquid manure should be given once a week. Plant dielytra spectabilis from pots in rich deep loam. Finish planting roses, and stake them at once. Examine tulip beds, and remove, with a knife, every particle of canker. Keep beds of pansies clean, and peg down the branches at equal distances, covering them with soil up to about two inches of the ends of the shoots. Lay down turf, turn gravel-paths, make box edging, and use the roller freely on lawns and walks. Train and trim ivy at the close of the month, reducing the growth on walls, &c., to one regular felt or layer of shoots; and removing all the leaves, so as to expose those shoots to view.

April.

Fruit Garden.—Protect wall trees from the east winds, and with something that may be easily removed, so that the trees have free air night and day, weather permitting, and be covered with the least possible trouble if the wind shifts to the east or the north. Pruning and grafting, in the exposed quarters, must be completed quickly. Abundance of water should be given to fruit trees in pots, and the orchard-house kept in an orderly state.

Forcing Department.—A moderate heat only should be given to general collections, and a strong healthy growth should be promoted by the admission of abundance of air, with a view of dispensing with the fires for the season. Many of the less tender things may be transferred to cold pits, to give room for other things that want continued protection to be brought to fine plants. Young stuff from the propagating-house should be potted as fast as rooted, and kept close till started afresh, and then gradually inured to air and light, so as to be vigorous by the middle of May. All tropical plants required for summer blooming should be hastened, and a quick growth promoted, so as to give them as long a season as possible for blooming, and ripening their buds for next year. Average temperature this month, 55° by night, 60° to 65° by day.

Kitchen Garden.—Sowings may now be made of all leading kitchen crops that are to succeed each other; and where the work of the last month has been delayed, seeds should be got in early. Windsor, longpod, and Johnson's Wonderful beans may be sown; Marrow, Auvergne, and dwarf mammoth peas, and a few rows of the earlier sorts to come in before the late peas are ready. Brussels sprouts, broccoli, cabbages, cauliflowers, horn carrot, Scotch kale, and savoy, for autumn use, should be put in. Among cabbages, Atkin's Matchless, Early York, and Shilling's Queen, and West Ham, are excellent kinds to sow now; but the principal crop of cabbages should be up by this time, and they should be hoed between when the ground is in a fit state. In ground deeply dug, but not manured, beet should be sown in the second week. The main crop of celery should be sown on a rich warm border, with the surface made light and fine; sow thin, and merely dust the seed over. Sow also asparagus, lettuce, onions, radish, sea-kale, and small salad —the two last in drills, one foot apart, and one inch deep for asparagus, and two inches for sea-kale. To raise seedling rhubarb plants, sow about the middle of the month in shallow drills, eighteen inches apart, dropping the seeds in patches, six inches from each other. Potatoes not yet got in should be planted without delay; and towards the end of the month, scarlet runners and French beans sown. The principal crop of carrots should be planted about the middle of the month; and there is still time for a crop of parsneps, but they must be sown directly. Slips of kitchen herbs will do any time this month, but will root quicker if planted in a rather dry sandy border.

Flower Garden.—Hardy annuals and pe-

rennials are to be sown early; and towards the end of the month the more tender sorts may be put into the ground; but very small seeds of choice plants need not be sown till next month, as heavy rains may wash them down into the soil, and cause them to be lost. Perennials may be planted out, and old stools of chrysanthemum, lychnis, phlox, &c., may be parted. Dahlia roots may also be planted; and if the shoots rise before the night-frosts are over, they should be protected by inverted flower-pots, and the holes covered with pieces of tile. Tigrida bulbs may be planted two inches deep; walks should be turned and rolled, and grass-plots dressed.

May.

Fruit Garden.—Plums and pears, and all bush and pyramid fruits, will require to be pinched in to the third or fourth leaf from the base. Strawberries should have plenty of water. If raspberries have not been mulched, give them at once a top-dressing of half-rotten dung. Do not dig it in. In the orchard-house renew the mulchings, if needful, giving abundance of water.

Forcing Department.—Plenty of air ought to be given to hard-wooded plants, and specimen plants in flower should have shade. Allow nothing to form seed, unless seed be specially desired. All kinds of shrubs that are out of shape should be cut back, and kept somewhat close afterwards, to obtain good breaks, so as to bring them into decent shape, and get the wood well ripened for next year's bloom. All soft-wooded plants advancing in growth should be shifted, stopped, and tied out; but if required to bloom shortly, they must not be disturbed, but merely kept in shape, and plenty of water and free ventilation allowed. Continue to strike bedding stock for late blooming. Fuchsias, geraniums, petunias, and verbenas make charming specimens for pot-blooming in the autumn, if struck now, and kept regularly stopped till July. The temperature should not be high for fuchsias especially, which like shade and moisture. Azaleas and camellias that have made their young shoots should have a little more ventilation, to prepare them for the open air next month to ripen their wood. Pelargoniums out of bloom should be cut in and allowed to break before re-potting them, and the syringe and fumigator kept in use, as may be necessary, to destroy the red spider and green fly. Fire-heat should be dispensed with as far as possible, before clearing and cleaning out the house.

Kitchen Garden.—Aim now at high culture with all vegetable crops; stir frequently between the rows with the hoe, to keep down weeds, and supply an abundance of water and liquid manure. Rows of peas should be staked, and those that are formed well banked up. Thin parsneps and carrots to eight inches apart, and go on transplanting from seed-beds as fast as the plants are of sufficient size to handle, leaving the smallest to become more vigorous before removing them. For transplanting choose showery weather, if possible, or else give shade for a few days, and gentle watering. Flat-hoe potatoes, and draw but little earth to their stems. Thin out celery, and make up small beds for the plants on very rich, hard ground. Trenches with about six inches of rotten dung forked into the bottom of each, should now be made for celery. Look to seed-beds, and transplant; well hoe and clear the ground as may be necessary. Sow beans and peas for succession, and savoy for a late crop. Beet-root, broccoli, cabbage, kale, kidney beans, both runners and dwarfs, cucumbers, lettuces, marrows, spinach, and turnips, may now be put into the open ground for a late supply.

Flower Garden.—Sowings should be made of all hardy annuals required to succeed those sown in March; and tender kinds, such as asters, zinnias, &c., may now be sown in the open ground. This is a good time to sow hardy and half-hardy perennials of all kinds. The Chinese primula should be now sown for the next spring. Late-planted roses should have an abundance of water, and the surface mulched; and similar treatment should be given to hollyhocks and chrysanthemums put out last month. Carnations and picotees should be staked without delay, and their shoots thinned. Part and plant polyanthuses and primroses done blooming, and give them a rich loam and a shady aspect. Roll and mow grass turf frequently, to promote a fine close growth; and make everything look clean and tidy, which greatly adds to the beauty of the garden.

June.

Fruit Garden.—Snails are now harbouring on the stalks, and among the side-shoots of raspberries. Look for them every morning. If large fruit is wanted, thin the blooms at once, and dispense liquid manure. Dis-bud and nail in. Pot trees to have plenty of water; and, if weakly in their new growth, give pretty strong doses of liquid manure at intervals of a week each. Pinch, regulate, and, where the fruit grows thick, thin it out.

Forcing Department.—If plants in flower are desired to be prolonged in their beauty, a shading of Shaw's tiffany or Haythorn's hexagon net should be used; the latter will also exclude bees and wasps; for flowers on which bees have settled, perish sooner than those to which they have no access. Cinerarias having ceased to bloom, may be propagated by suckers and side-shoots; if the plants are turned out on a border, and heaped round the collar with sandy loam, they will give out suckers, which may afterwards be slipped off with a portion of root attached.

Kitchen Garden.—By this time the ground will be, for the most part, entirely occupied, and everything in full growth. The hoe must never be idle. Next to keeping down weeds, give plenty of water; but do not drench to excess plants lately put out, lest a chill should check their growth. Cucumbers, gourds, tomatoes, and capsicums may be put out in a rich soil, giving a sunny aspect to the tomatoes. Manure-water should be freely given to all crops in full growth, especially to strawberries; but there should be two or three waterings with plain water, to one with liquid manure. Sow beet, cabbages, cauliflower, endive, early horn carrots, French beans, lettuces, radishes, spinach, scarlet runners, turnips, and peas and beans. Salad plants should have a shady situation, or they may run to seed. In sowing peas and beans, depend on the earliest sorts at this time of the year, as they are soon off the ground; but Knight's Marrow and Bedman's Imperial are excellent peas to sow now for late supply. Dress asparagus and sea-kale beds with one pound of salt to every square yard, and give the asparagus powerful doses of liquid manure from horse-dung.

Flower Garden.—Newly-made lawns require a little special care at this season. Carnations, pinks, and picotees, may now be propagated by pipings on the north side of a fence, or in pots half filled with sandy loam. Ranunculuses require water frequently; and beds of valuable kinds must be screened in the same way as tulips, with netting or canvas. Pansies strike readily from short side-shoots; the old hollow stems will also strike, but never become good plants; the new growth is that to be depended on. Dahlias should be immediately staked, if not done at the time of planting, so as to avoid damage to the roots when they have begun to grow. Perennials should be sown for next season's blooming, that strong plants may be obtained. So thin in nursery beds, and prick out the plants in rows as soon as they make rough leaves.

July.

Fruit Garden.—Gooseberry and currant bushes should be kept open in the centre; and leave on the bush-fruits only as much wood as will bear a fine crop next season. Cuttings of gooseberries and currants may be struck now in a moist shady border. Mulch raspberries with half-rotten dung. Strawberry beds should be well attended to. Strong-rooted runners should be taken off to form new plantations, and be pricked out into well-manured beds, pretty close together. After three years, strawberry beds cease to pay, and should be broken up, and the ground trenched for winter crops.

Forcing Department.—All green-house plants require shifting for late blooming, and they should be grown to a good size before allowed to blossom. Cinerarias for winter blooming must have good culture and shifts as required, and camellias may be shifted if necessary. Ericas generally require to be pruned, and cleared of seed-pods and dead flowers. All the ventricosas should be put into the open air in a north aspect, and sheltered with spare lights during heavy rain. All those with woolly leaves should be put in cold pits, and kept shaded at mid-day. Any not shifted in the spring should be cut in at once, and as soon as they break re-potted. Re-pot leschenaultias. Every kind of hard-wooded plants may be re-potted now if out of bloom.

Kitchen Garden.—Clear the ground, and dig it over at once, from which early crops have been taken. Brussels sprouts, kale, savoys, cabbages, broccolis, &c., should be planted out in ground deeply dug. For winter spinach, seed-beds should now be made up and well manured, and the seed put in without delay. In gathering French and runner beans, all should be taken or none. If seed is desired, a row should be left untouched. Never take green pods and seeds from the same plants. Take up garlic, onions, and shalots as they ripen, and store them for winter. Give asparagus beds plenty of liquid manure. Earth up celery for early use, and plant out the main crop as soon as the ground is ready. Artichokes should be cut down. Hoe between all growing crops, and especially potatoes. Top runners, and keep them well staked. Sow the last succession of runners and French beans; also endive, lettuce, peas, radish, small salads, spinach, Stadtholder and Mitchell's cauliflower, and turnips. High and dry land may be planted with potatoes now, for use early next spring.

Flower Garden.—The most important operation this month is budding. Out of doors, cuttings of all kinds may be struck; including, besides the bedding of every sort of plant, most kinds of hardy evergreen shrubs, the young shoots of which soon make roots in the shade. Dahlias want special attention as they come into bloom. Another lot of pompone chrysanthemums should be struck this month, under hand-glasses, to make dwarf plants for the window and greenhouse in autumn. Layer carnations, picotees, and pinks; and put pipings of the same into a gentle bottom-heat.

August.

Fruit Garden.—To keep off the birds, nets should be thrown over the fruit-bushes, and a little shade given to keep a few bunches hanging for a late supply. Nail in all good shoots on wall trees, that they may have the heat of the wall to ripen them. In dry weather gather fruit; and, as a rule, not till quite ripe. Plant strawberries.

Forcing Department.—Such pelargoniums as have been pruned back and rested, should be re-potted as soon as they have broken regularly. Place them in the smallest pots into which their roots can be got, so as to allow of a series of shifts till they are once more in their blooming-pots. Young plants and green-house shrubs should be well hardened now before going to their quarters for the winter. Camellias and azaleas should have plenty of sun, and little water. Summer-struck geraniums, achimenes, and fuchsias, may be got into bloom now, in order that a display may be kept up till Christmas.

Everything that requires potting should be so done at once, as all plants get through the winter best when their pots are full of roots.

Kitchen Garden.—Brussels sprouts, broccolis, savoys, Scotch kale, &c., ought now to be strong; and where they have been planted between rows of peas, to stand the winter, they should now be looked over, and every other plant taken out, to make fresh rows if they are crowded. Most sorts of cabbages may be sown in the second week of August; Red Dutch, Shilling's Queen, Sprotborough, and West Ham, ought to have a place in every garden. Prickly spinach should be sown on slopes in rich soil, and plenty of hardy green Hammersmith and black-seeded cos lettuce. Cauliflower should be got in from the 7th to the 20th, to keep over winter in frames. The summer-sown endive will now be strong enough to plant out on slopes or raised beds. Leeks should be earthed up, and the rows of parsley thinned out, so as to get rid of every plant not well curled.

Flower Garden.—Bedding plants should be propagated for stock. Strike verbenas and petunias from the points of young shoots; and strike calceolarias in chopped moss or peat. Herbaceous plants, such as pansies, dielytras, double walls, double Canterbury bells, double feverfew, and hollyhocks, may also be struck in quantities to keep over winter in frames. Dahlias and hollyhocks should be kept well fastened, and put stakes to chrysanthemums before their heads get heavy, as a protection against storms. Pompones may still be struck for blooming in pots. Pinks and carnations may be planted out in nursery beds, in well-manured loam. Give plenty of water to chrysanthemums, with occasional doses of strong liquid manure. Pansies may be sown, as may also most hardy

annuals, to stand over winter for early blooming next spring. Roses and fruit trees should be budded in damp, dull weather; they take best just after heavy rain. In budding on the manetti stock, enter the bud just above the collar, close to the ground.

September.

Fruit Garden.—When the pips of apples and pears have become dark in colour, it is usually taken as the signal for harvesting the crop; but in looking for this sign a sound fruit must be taken, not one that has been pierced by an insect. Have all fruit gathered with care, and stored without bruising.

Forcing Department.—The growth of all hard-wooded plants should be well ripened while there is plenty of sun-heat. Bedding plants should be got into small pots as speedily as they make good roots in the borders, or can be spared from the decorative grounds, if worth keeping. Keep the houses gay with amaranthus bicolor, balsams, cockscombs, coleus, fuchsias, gladioli, heliotropes, liliums, and plants with fine foliage.

Kitchen Garden.—Winter stock which was sown last month may now be sufficiently forward for planting out. The ground from which onions have been cleared is usually the best for cabbages for spring use. Winter spinach should be thinned to six inches from plant to plant; also the rows of lettuce that are to stand the winter. Celery should be earthed up as the rows require it in dry weather. Sow saladings, and gather seeds as fast as they ripen. Potatoes should be taken up as the tops wither; but carrots and beetroot may remain till the frost cuts off the foliage, no longer. Parsneps may be left in the ground, to be trenched out as wanted for use, unless the space is required, in which case store them in sand.

Flower Garden.—Plant out pinks and carnations, and rooted cuttings of herbaceous plants. The season has now commenced for planting bulbs, but tulips should not be put into the open ground till next month. This and next month are the best times for striking calceolarias.

October.

Fruit Garden.—Gooseberries, currants, and raspberries may be moved towards the close of this month; and new plantations made on ground deeply trenched and manured. Gooseberries and raspberries need a richer soil than currants; and black currants and raspberries will thrive in more marshy ground than any other of the bush-fruits. Root-pruning and planting may be commenced in the last week of the month; but root-pruning should only be resorted to in cases of over-luxuriant, unfruitful trees.

Forcing Department.—House at once whatever is to be wintered under glass. Chrysanthemums ought now to be in such bloom as to keep the house gay for a while; and, as they go off, fuchsias and geraniums, from summer cuttings, should be got into bloom by giving the plants good places and shelter from draughts.

Kitchen Garden.—In getting ready for next year's crops, first trench over the ground intended for root crops; and choose for potatoes, carrots, parsneps, and beet, plots that have been well manured this year. Plant out the August-sown cabbage; leaving the weakest in the seed-bed for future planting. Also plant out lettuce in a warm situation; taking up potatoes, carrots, beets, and parsneps. Earth up celery; lay cabbages and broccolis that are forward with their heads to the north. Asparagus beds should be forked over, and all litter cleared away. Remove the stems with a knife, and dress the crowns with manure, and a little fresh mould over all. This is the best time to make plantations of rhubarb for next season's produce. Tomatoes, not ripe, should be cut with a length of stem, and taken into a warm green-house, where they will soon ripen.

Flower Garden.—Chrysanthemums should now be securely staked; plants in pots trained out, and made neat and tidy, for blooming; give plenty of water. The bulbs to be planted this month are crocuses, crown imperials, hyacinths, irises, liliums, narcissus, jonquils, daffodils, scillas, and early tulips. For late tulips, next month is sufficiently early; and anemones and ranunculuses are best kept out of the ground till February, except in places where autumn planting has been proved to be congenial to them, in which case it is preferable. Herbaceous spring-flowering plants may be got into the borders, to bloom

at the same time as the bulbs, such as alyssum, arabis, aubrietia purpurea, dielytras, iberis, pansies, polyanthuses, primulas, wallflowers, &c.

November.

Fruit Garden.—Prune and plant as weather permits. Prune bush-fruits, and fork the ground over between the rows. Burn the prunings, and strew the ashes over the newly-forked surface. Red and white currants should be cut back to skeletons. Old apple trees should be scrubbed, if infested with blight, with a strong brine, and the holes stopped with a mixture of clay, sulphur, soot, and cow-dung, beaten together into a tenacious paste.

Forcing Department.—Begonias, camellias, chrysanthemums, fuchsias, late-struck geraniums, and salvias, will now contribute greatly to the gaiety of the conservatory.

Kitchen Garden.—Wherever trenching and digging are required, let it be done without delay. Turf should be stacked, and the clippings gathered for burning, to make dressings of manure for beds and borders. The general work of the kitchen garden is only a continuation of last month.

Flower Garden.—Get under cover, without delay, whatever is too tender to bear the frost. Get up dahlias, tally, and stow them away, out of the reach of frost, moisture, and heat. Obtain a supply of rose stocks at once, if you intend to graft or bud for yourself next season. Plant in good loam, and stake them securely. Plant bulbs as soon as possible, both in beds and borders.

December.

Fruit Garden.—Old fruit trees should be dug round, and a layer of old dung, six inches thick, laid down in a ring, three feet round the stem of each, to improve the size of the fruit against next season. Any trees that grow too luxuriantly to bear well, should be pruned at the roots. Protection to any tender fruit trees should be given, and boards, in a slope, laid over vine borders to shelter them from excessively cold rains. Strawberry beds may be made this month; but it is not a favourable period for strawberries. Bush-fruits should be planted, potted, pruned, and mannred. Gooseberries and currants may be lightly forked between, to amalgamate the manure with the soil; but raspberries should have three or four inches of dung, not very rotten, laid over the piece, and the soil between them should not be dug at all. Orchard-house trees may be pruned; and it is recommended that they be washed with a solution of eight ounces of Gishurst to a gallon of soft water.

Forcing Department.—Till after Christmas chrysanthemums will keep this department gay, when the first lot of forced shrubs, especially azaleas, will be ready to take their place. Hard-wooded plants in the green-house must have as much air as the weather will permit, and as little water as possible, from the expectation of frost setting in. The thermometer should not descend below 38°. Ericas should have air at every opportunity; and if forced with other flowering shrubs, must have the coolest place in the forcing-pit, and be very gently stimulated. Green-house temperature, 40° to 45°.

Kitchen Garden.—Plantations of asparagus, horseradish, rhubarb, and sea-kale should be made. Roots of dandelion, packed together in leaf-mould, and put into gentle heat, will, in five or six weeks, furnish a delicate salad. Early peas and beans should now be sown on warm dry slopes; and broccoli heeled over, with their heads to the north.

Flower Garden.—Bulbs ought to be all planted by this time; but if any remain out of the ground, they should be got in without delay. Fuchsias to remain out all the winter should be cut down, and their roots covered with litter or coal-ashes. Pansies, pinks, and other choice things in open beds, should have a little light litter sprinkled over them in frosty weather, or be protected with canvas on hoops. Protect tulips in the same way.

DIVISION XI.

THE BEE, AND THE MANAGEMENT OF THE APIARY.

INTRODUCTORY; INTEREST ATTACHED TO THE BEE; FUNCTIONS OF BEES; NUMBERS IN A HIVE; ATTACHMENT AND HOMAGE TO THE QUEEN BEE; THE PASTURAGE OF THE BEE; PRODUCTS OF THE BEE; CONSTRUCTION OF THE COMBS; THE FORMATION OF SWARMS; THE APIARY; DIFFERENT SORTS OF HIVES; SITUATION OF THE APIARY; THE DESTRUCTION OF BEES.

INTRODUCTORY.

Addison, in his 209th *Spectator*, translates some of the iambics of Simonides, and tells us that this poet was famous in his generation, and that he is the author of the oldest satire now extant. The subject of this satire is woman; and we find him stating that the souls of one kind of women were formed out of those ingredients which compose a swine; a second were formed out of the same materials that enter into the composition of a fox; a third were made up of canine particles; a fourth were made out of the earth; a fifth were composed of the sea; a sixth were manufactured of the ingredients which make an ass, or a beast of burden; the cat supplied the materials for a seventh species of women; the mare with a flowing mane, which was never broken to any servile toil and labour, composed an eighth species of women; the ninth kind were taken out of the ape; and the tenth, and last, sort were made out of the bee. In reference to this species, Simonides says—"Happy is the man who gets such an one for his wife! She is altogether faultless and unblamable. Her family flourishes and improves by her good management. She loves her husband, and is beloved by him. She brings him a race of beautiful and virtuous children. She distinguishes herself among her sex. She is surrounded with graces. She never sits among the loose tribe of women, nor passes away her time with them in wanton discourses. She is full of virtue and prudence, and is the best wife that Jupiter can bestow on man." Simonides lived about 400 years after the siege of Troy; and, as Addison remarks, "shows, by his way of writing, the simplicity, or rather coarseness, of the age in which he lived." But, whatever may be the simplicity or the coarseness of his manner of writing, he has certainly been highly complimentary to the *virtues* of the bee, if we are to consider that such women as his tenth species could be composed of the forms, qualities, and instincts of that notable insect. If so, we trust that every kind and careful bee-master may have the happiness of falling in with a *bee-wife*.

INTEREST ATTACHED TO THE BEE.

"The bee is little among such as fly; but her fruit is the chief of sweet things." This is the language of the Scriptures; and from the ancients this insect has claimed a greater interest than it has done among the moderns. No nation upon earth has had so many historians as this remarkable creature. De Montfort, who drew "the portrait of the honey-fly," in 1646, enumerates the authors up to his time who had written upon the same subject; and they amount to between five and six hundred. Varro, Columella, Celsus, and Pliny have each given in their contributions to the subject; and some idea may be formed of the minuteness with which they extended their investigations from a passage in Columella, who, in speaking of the origin of bees, says that Euhemerus maintained that they were first produced in the island of Cos; Euthronius, in Mount Hymethus; and Nicander, in Crete. The subject of the fourth book of the *Georgics* of Virgil, is the management of bees. Their habits, economy, polity, and government are described with great fidelity, and with all the charms of poetry. In David-

son's translation, the invocation runs—"Next will I set forth the heavenly gift of aerial honey. Vouchsafe, Mæcenas, thy regard to this part, also, of my work. I will sing spectacles to you marvellous of minute things; the magnanimous leaders, the manners and employments, the tribes and battles of the whole race in order. My labour is upon an humble theme; but not mean the praise, if the adverse deities permit one, and Apollo invocated, hear." Virgil, however, in this *Georgic*, has proved himself a better poet than a well-informed naturalist.

Besides the multitude of authors who have written express treatises on bees, periodical works have been published, confining themselves entirely to their management and economy; whilst learned societies have been established with the sole view of conducting researches upon this subject. The most distinguished association of this kind is the *Société des Abeilles*, founded upwards of half a century ago, in Little Bautzen, a village in Upper Lausatia, under the auspices of the Elector of Saxony. The labours of this society have greatly added to the general stock of knowledge on the subject of bees.

FUNCTIONS OF BEES.

Every reader of the Scriptures knows that the Supreme Being has, in many senses, supplied the houseless and the wanderer with "wild honey," and "in a piece of honeycomb," and "honey out of the stony rock;" whilst, "a land flowing with milk and honey," has, from the first, been the type of another and a better country. The little honey-maker, too, is, in itself, one of the most marvellous proofs of the goodness and power of the Almighty. "Wise in their government," observes Kirby, "diligent and active in their employments, devoted to their young and to their queen, the bees read a lecture to mankind that exemplifies their Oriental name, Deburah, *she that speaketh*."—"That within so small a body," says another writer, "should be contained apparatus for converting the virtuous sweets which it collects into one kind of nourishment for itself; another for the common brood; a third for the royal; glue for its carpentry; wax for its cells; poison for its enemies; honey for its master; with a proboscis almost as long as the body itself, microscopic in its several parts, telescopic in its mode of action; with a sting so infinitely sharp, that, were it magnified by the same glass which makes a needle's point seem a quarter of an inch, it would yet itself be invisible, and this, too, a hollow tube;—that all these varied operations and contrivances should be enclosed within half an inch of length, and two grains of matter; while, in the same small room, the large heart of at least thirty distinct instincts is contained, is surely enough to crush all thoughts of Atheism and Materialism," wherever such opinions may be held.

The leading feature in the history of bees, and one which gives them a marked distinction from almost all other insects, is the different kinds into which they are distributed, and which, to all appearance, constitutes so many different modifications of sex. First of all comes the drone, who may readily be known from the heavy noise which he makes, and from which he has received his name. He is the "lazy, yawning drone" of Shakespeare; and is, indeed, all over the world, a by-word, applied to those who are more lazy than active—more sleeping than awake when performing any duties that may be assigned them in the several positions they may have been called to occupy in life. "The drone," says Butler, "is a gross stingless bee, that spendeth his time in gluttony and idleness. For howsoever he brave it with his round velvet cap, his side gown, his full paunch, and his loud voice, yet he is but an idle companion, living by the sweat of others brows. He worketh not at all, either at home or abroad, and yet spendeth as much as two labourers: you shall never find his maw without a good drop of the purest nectar. In the heat of the day he flieth abroad, aloft and about, and that with no small noise, as though he would do some great act; but it is only for his pleasure, and to get him a stomach; and then returns he presently to his cheer." This lazy member is distinguished by a thicker body, a more flattened shape, a round head, and more obtusely terminated abdomen, within which are contained the male organs of generation, as he is admitted to be the male of the species. The queen-bee is the next and the most dis-

tinguished *character* in a hive. In fact, she reigns over her people. She is—

> "First of the throng, and foremost of the whole,
> One stands confest the sovereign of the soul."

Her embrace is said to be fatal to the drones, and her power was acknowledged long before her sex was known. Greeks, Latins, and Arabs invariably designate her as the king; and so does Shakespeare.

The queen-bee is, however, not a king-bee; and she is said, by an old author, "to differ from the vulgar, both in shape and colour." Her abdomen is of greater length, and she is provided with a sting and two ovaria of considerable size. The working bees compose the third class, and are marked by the smallness of their size, the length of the proboscis, the singular structure of their thighs and legs, and by the *seeming* want of generative organs. These are now set down as undeveloped females. Mr. Scherach, of Little Bautzen, and secretary to the Lausatian Society, has proved this. It is on these creatures all the laborious duties incident to the community devolve. They are the working classes, who construct the interior of their habitation; explore the fields in search of food and other materials; bring them to the hive, and apply them to the purposes for which they are adapted. They are also the constant attendants of the queen, whose wants they supply; besides being the soldiers of the hive, which they defend against the attacks of enemies; so that their whole lives is a scene of constant and busy occupation, from early dawn till close of day, when the weather and season are congenial to their employments. The lives of the females are chiefly occupied with laying eggs, and conducting the colonies, which, at certain periods, emigrate from the parent hive; so that the drones seem to be the only encumbrances upon the state. They have, however, their uses, as everything in nature has. They perform the important duty of impregnation; but they perish the moment they have fulfilled their purpose.

NUMBERS IN A HIVE.

In a hive there is usually only one perfect queen existing at a time, and she receives all the honour, deference, and affection to which she is entitled by the dignity of her station. The number of labourers, however, vary considerably in different hives. In a strong hive there are about 15,000; and of drones about one to ten of these. This proportion, though seldom exact, is rarely very much exceeded or fallen short of. According to Dr. Bevan, a single family, where swarming is prevented, will sometimes amount to 50,000 or 60,000. A writer observes, upon the strength of a hive, that the drones, even in the spring, seldom compose more than one-thirtieth or one-fortieth of the whole; and at other seasons there are none to be found in the hive. "In order to form an estimate of the number of bees which can occupy a certain space, Mr. Hunter counted what number of drowned bees could be contained in an ale-house pint, and found it to be 2,160; so that if a swarm were to fill two quarts, their numbers would be nearly 9,000. Reaumur, with the same view of ascertaining their numbers, employed the more accurate method of weighing them. He found that a collection of them weighing one ounce, consisted of 336 bees; and, therefore, that sixteen ounces, or one pound, would consist of 5,376 bees."

ATTACHMENT AND HOMAGE TO THE QUEEN-BEE.

The sole province and occupation of the queen of a hive is to lay eggs, which, in the height of the season, she does at the rate of 200 a day. If the weather be particularly warm and favourable, she will lay even more than that; and continue to do so, though at a gradually diminishing rate, till the approach of cold weather in October. "So early as February she resumes her labours in the same department, and supplies the great blank made in the population by the numerous casualties that take place between the end of summer and the commencement of spring. Her *great laying* of the eggs of workers begins generally about the fifth day of her age; and she continues to deposit eggs of the same kind for the succeeding eleven months; after which she commences laying those of males." In the operation of laying the queen puts her head into a cell, and remains in that position not more than a couple of seconds; after which she withdraws her head, curving her body

downwards; inserts her abdomen into the cell, and turns half round on herself. In a few seconds the egg is safely deposited in the cell, when she withdraws her body, and thus passes on from cell to cell. Whilst she is making this *progress* she is the subject of the most marked attention of the workers. They show their affection for her by caressing her with their antennæ, and occasionally supplying her with food from their probosces. "On one occasion," says the writer of the article on the bee, in the *Naturalist's Library*, "we gave her subjects an opportunity of testifying their *courage* in her defence, as well as their affection and zeal. Observing her laying eggs in the comb next to the glass of the hive, we gently but quietly opened the pane, and endeavoured to seize her. But no sooner did the removal of the glass afford room (while shut, it was almost in contact with her back), and before we could accomplish our purpose, they threw their bodies upon her, to the number of, at least, a hundred, and formed a cone over her of such magnitude, that she could not be less than two inches distant from any part of the surface. We dispersed the mass with our finger, and got hold of her precious person, and kept looking at her for some minutes before we restored the captive to her alarmed defenders. It is remarkable that this violence was not resented by them: though they coursed over our hands in scores while we kept hold of their mistress, not one individual used its sting. The all-engrossing object was the queen." The same writer remarks, that bees may be even roughly handled without danger of being stung when they are swarming. Then, being only intent on securing a habitation for themselves and their sovereign, they seem incapable of entertaining, at the same moment, two different *ideas*, and their natural irritability is not awakened to exertion. There is one striking feature in the natural history of queen-bees; and that is, the hatred which they have for each other. Queen Elizabeth's to Mary, Queen of Scots, was as nothing to it, notwithstanding that it stimulated the English lady to take off the head of her fairer cousin. When two queen-bees in a hive happen to emerge from their cells at the same time, a pitched battle takes place, which is only terminated by the death of one of the combatants. This mutual enmity is an inborn disposition with them. No sooner has the queen-bee in a hive thrown off a second swarm, and escaped from her own cradle, than she hurries away in search of her rival, and, with the most impetuous eagerness, uses every exertion to destroy her.

To rehearse the many stories which have been told of the attachment and homage which the working bees show to their queen, would be endless. One or two must suffice. In the notes to Dr. Evans' poem of *The Bees*, we find the following affecting anecdote:—"A queen, in a thinly-peopled hive, lay on a honeycomb, apparently dying; six workers surrounded her, seemingly in intent regard, quivering their wings as if to fan her, and with extended stings, as if to keep off intruders and assailants. On presenting them honey, though it was eagerly devoured by the other bees, the guards were so completely absorbed in their mournful duty, as entirely to disregard the proffered banquet. The following day, the queen, though lifeless, was still surrounded by her guard; and this faithful band of attendants, as well as the other members of the family, remained at their post till death came kindly to extinguish both their affections and their grief; for though constantly supplied with honey, not a bee remained alive at the end of the four days." This is an extraordinary instance of bee devotedness; and, we presume, is not common. We can give, from another writer, an instance of an opposite kind. It is in the case of a hive which, having early exhausted its store, was found, on being examined one morning, to be utterly deserted: the comb was empty; and the only symptom of life was the poor queen herself, "unfriended, melancholy, slow," crawling over the honeyless cells—a sad spectacle of the fall of bee greatness. The writer thinks that Marius among the ruins of Carthage, or Napoleon I. at Fontainebleau, was nothing to this. In reference to the homage which they show their queen, if we are to believe Sydserff, it would appear, that "whenever the queen goes forth to take the air, as she often does, many of the small bees attend upon her, guarding her before and behind. By their sound I have known when her majesty has been coming forth, and have had

time to call persons who have been desirous of seeing her." These are human rather than insect characteristics; although similar anecdotes are well attested by other authorities.

THE PASTURAGE OF THE BEE.

For the *physiology* of the bee, we must refer the reader to such works as specially treat upon that branch of the subject, our space being insufficient to enter upon it at length: we must, therefore, confine ourselves to the more practical management of the bee, and such portions of the subject as may be supposed to be more desired to be known by the common keeper of a hive or an apiary. In noticing what is necessary to the nourishment of bees, we may observe that their food consists chiefly of two kinds—the fluid secretions of vegetables contained in the nectarea of the flowers, and the dust of the antheræ, which has been designated by botanists, the pollen; but which, when collected by the bees, has received a variety of names, such as farina, raw wax, bee-bread, and others. Occasionally, however, we find bees feeding upon other saccharine substances besides honey, such as honey-dew, treacle, syrup, &c. A large quantity of ink has been consumed by writers who have treated of the poisonous effects of some plants, not only upon the honey, but sometimes upon the bees themselves. Every classic schoolboy will be able to recall the narrative which Xenophon gives of the effects produced upon the Ten Thousand, by the honey of which they partook in the neighbourhood of Trebizond. The soldiers were affected in proportion to the quantities they had taken. Some seemed drunk; some mad; and some even died the same day. This quality in the honey has been referred by Pliny, and some others, to the poisonous nature of the rhododendron, of which there is an abundant crop in those parts. But this is not to be believed; for it has been found that the honey in this country is not affected in districts where the rhododendron abounds; nor, indeed, is the common bee ever observed to settle on its flowers.

If we are to nourish or cherish bees, of course the pasturage on which they are to feed ought to be one of our first considerations. Yet we have heard of a man who kept bees on the top of his house in Holborn; and wishing to find out where they pastured, he sprinkled them all with a red powder as they came forth from the hive in the morning. He then set off to Hampstead, deeming it the nearest as well as the best bee-pasture in the neighbourhood of London; and what was his delight at beholding, amongst the crowds of other bees, some of his own, carrying upon their industrious persons the *marks* of his own ingenuity, by which they were to be singled out from the others. The apiary of Bonner, a great bee observer, was placed in a garret, in the centre of the city of Glasgow; and that of Mr. Payne, the author of *The Bee-keeper's Guide*, was placed in the middle of a large town. It is conclusive, then, that the industrial populations of these hives would have to fly over the chimney-tops in order to get to the fields; and if there was plenty of Dutch clover (sometimes called honeysuckle) in them, they would be sure of making a good honey year. This is one of their favourite flowers, the red clover being too deep; for the proboscis of the common bee is not so useful to it as it is generally thought to be. There have been made many lists of bee-flowers, and of such as are deemed suitable for planting round the apiary. It has been suggested that mignonette, borage, bugloss, rosemary, lavender, the crocus for the early spring, and the ivy flowers for the late autumn, might assist in making up a pretty bee-garden. Pliny recommends thyme, apiaster, violets, roses, and lilies. There is no doubt that the prevalent flower of a district will flavour the honey. The fine honey of the Isle of Bourbon will taste for years of the orange-blossoms, from which, we understand, it is gathered; and, on opening a bottle of it, the room will be filled with the perfume. The same is the case with the honey of Malta. Corsican honey is said to be flavoured by the box-tree; and honey has been pronounced utterly valueless, from its having been gathered in the neighbourhood of onion-fields. Dr. Bevan suggests that lemon-thyme should be used as an edging for garden-walks and flower-beds, instead of box, thrift, or daisies; but we think, on the whole, it little matters to the bee what flowers are placed in the garden, as it is too much of a wanderer to confine itself to such an artificial spot. It is in the wild tracts of heath

and furze, the lime avenues, the clover meadows, and the broad acres of bean-fields in which it finds its delight, and from which it culls the sweets with which it stores its cells.

CONSTRUCTION OF THE COMBS.

Bees almost invariably commence building their combs from the top, continuing it downward, as far as they have room; and finishing it off at the bottom in a somewhat irregular curved line. Each comb possesses a double set of honey-cells, *dos-à-dos*, in a horizontal position. These are the receptacles of the eggs which the queen lays, and which are constructed, not with propolis, but with wax. To sustain them in common straw hives, cross-sticks are employed, round which the labours of the bees are carried on, so that the comb is often almost laid in ruins in detaching it from these wooden supports. This circumstance, however, has, in a great measure, been obviated by fixing a small piece of comb under several removable bars, and inducing the bees to work upon them. Huber, we believe, was the first to accomplish this. He fixed a small piece of comb under each of the bars, exactly parallel. The bees then followed their leader, so that any one of the pendant combs could be lifted upon the bar: this again replaced, and the bees once more set to work. This point, from which they commence their operations, is called the guide-comb; and the hive itself, though somewhat modified, is the same as that of the Greek islands. In constructing the combs, it is observed, in the *Naturalist's Library*, that the two classes of *wax-workers* and *nurse-bees* have their separate and distinct provinces. "That of the former is to supply the rough materials, and attach them coarsely together; and that of the latter to finish and perfect the edifice. And while these last are occupied in this more refined operation of finishing and polishing, the former, like industrious labourers, are continually bringing forward additional loads of materials. One comb is scarcely begun, or contains not more than two or three rows of cells, when the busy architects proceed to lay the foundations of two others, one on each side of that already founded; continuing their operations in this manner till they have taken in the whole range of their building-ground; and with such diligence do they ply their labours, that in one day they will construct no fewer than 4,000 cells. A comb measures, in thickness, generally one inch; and the interval between them is about one-third of an inch, affording a passage for two bees, back to back, without obstruction or inconvenience. These dimensions, however, are varied according to circumstances."

THE FORMATION OF SWARMS.

The breeding season of the bee begins about the end of January, or early in February, and continues throughout the summer with constantly augmenting progress and activity. The population, therefore, increases with amazing rapidity; and the heat of the hive rises to such a degree, as to be frequently above 100°. This, doubtless, coupled with the want of accommodation, hastens the swarming, although the jealousy and outrageously destructive propensities of the royal mother is said to be another of the principal causes. The commencement of the swarming season is in spring, as no swarm will ever take place while the weather is cold, or until the hive is well stocked with eggs of every description. The queen, in consequence of the vast number of eggs she has parted with, is now more slender than she was, and better adaped to make an excursion through the air. "Her aversion to the royal brood which she seems to foresee will in no long time become able to dispute the throne with her, and the vain attempts she makes to destroy them in the cradle, in which she is invariably repelled by the bees who guard them, produce in her a constant restlessness and agitation, which, as Huber represents it, rises to a degree of delirium." This frenzy acts upon the workers; a tumultuous noise resounds through the hive, and everything gives token of a change. This occurs a few days before the swarm actually takes wing, whilst provisions are being collected in larger quantity by the workers. Mr. Knight, in the *Philosophical Transactions*, gives a curious account of their manœuvres about this time. In the cavity of a hollow tree, which, by the application of a board, had been fitted up for the reception of the swarms, he constantly observed, "that about fourteen days previous to their arrival,

a small number of bees, varying from twenty to fifty, were every day employed in examining, and, apparently, in keeping possession of the cavity; for, if molested, they showed evident signs of displeasure, though they never employed their stings in defending their proposed habitation. Their examination was not confined to the cavity, but extended to the external parts of the tree above: every dead knot particularly arrested their attention, as if they had been apprehensive of being injured by moisture, which this might admit into the cavity below; and they, apparently, did not leave any part of the bark near the cavity unexamined. A part of the colony which proposed to emigrate, appeared, in this case, to have been delegated to search for a proper habitation; and the individual who succeeded, must, apparently, have had some means of conveying information of his success to others; for it cannot be supposed that fifty bees should each accidentally meet at and fix on the same cavity, at a mile distant from their hive, which Mr. Knight has frequently observed them to do, in a wood where several trees were adapted for their reception; and, indeed, he observed that they almost uniformly selected that cavity which he himself thought was the best adapted for their use. It not unfrequently happened that swarms of his own bees took possession of these cavities; and such swarms were, in several instances, followed from his garden to the trees; and they were observed to deviate very little from the direct line between the one point and the other, which seems to indicate that those bees who had formerly acted as purveyors now became guides."

The first settlement of a swarm is, doubtless, merely a spot, or place of rendezvous anterior to the emigation that is to establish them. If they are not hived they will soon take flight, and in a direct line, for some locality which their instinct has previously marked out as suitable for their accommodation. They have been known to make straight for an old hollow pollard, the only one to be found within a mile or two of the hive. The first swarm is invariably accompanied by the old queen, who, on this occasion, *looks out* for a fine day, as she has a strong aversion to leaving home in bad or disagreeable weather. For after-swarms, it would appear, she is not so particular. If the first swarm sends forth a colony the same year, it is the same queen who places herself at the head of her wandering subjects, in the settlement of which she takes a truly parental interest. In descanting on this part of our subject, a writer says, that "there seems to be an unerring method by which the exact time when the first swarm will leave the hive can be determined—their hanging from the entrance being very fallacious — except by watching the general state of things within. With the after-swarms, however, there is a most curious and certain sign in the 'piping' or 'trumpeting' of the queen and the princesses. About the ninth day from the issue of the first swarm, if another colony is about to leave the hive, this singular duet, in most regular intonation, between the emerged queen and the princess still a prisoner in her cell, is heard; and extravagant as the account may seem, and confused and embellished as it has been from the times of Aristotle and Virgil, till recent days, it is now the practical sign by which every attentive bee-keeper judges of the time of emigration of the after-swarms. The second swarm is called a 'cast;' the third, a 'smart;' and the fourth, a 'squib.' A swarm from a swarm is called a 'maiden' or 'virgin' swarm, and the honey is reckoned more pure. It seldom, however, happens that there are more than two from the same hive, except in some very fine bee-years; and there are, on an average, two good years in every ten."

THE APIARY.

The objects which ought to be chiefly attended to in the construction of an apiary are various, and should be constantly kept in the view of the bee-master whilst engaged in the important task of making a domicile for his insects. The first is the security and multiplication of colonies; the augmentation of their productive labour; the obtainment of their products with ease and certainty, and with the smallest possible injury to the stock. Besides these primary objects, the apiary should give to its inmates the best possible shelter against moisture and the extremes of heat and cold; but more especially against sudden changes of temperature. It should also be a principal means of protection against

their enemies, and furnish them with every facility for the construction of their combs, and the rearing of their juvenile broods. It should, likewise, admit of every part of the combs being occasionally seen, and be capable of being removed when required; and it should be made of materials that are durable. In the construction of hives, much ingenuity has been, from time to time, exerted by apiarians, who have laboured to unite, in the greatest possible degree, all these advantages; but success to that extent, so far as we are aware, has not yet been attained. It would be impossible, as, indeed, it is unnecessary, for us to describe all the different sorts of hives which have been constructed for the bee; but those made of straw, we believe, are generally preferred, on account of their being less liable to over-heating by the solar rays, and likewise of easier purchase, from their lowness of price. They also possess the merit of keeping out the cold better than other hives of greater pretensions. Of *straw* hives, notwithstanding the imperfections of those of the common bell-shape, there are many in use, because they cost little, and are easily made; and because there is no great skill required in the handling of them. They ought, however, to be globularly shaped, having the third of their diameter cut away. This would make them concentrate, and retain the heat better, and thereby accelerate the hatching of the eggs, on the success of which so much depends.

DIFFERENT SORTS OF HIVES.

Wildman's storeyed straw hive is, by many, preferred to modern hives made on the same plan. It consists of two or more storeys, each seven inches in height, and ten in diameter. There is a hoop of about half an inch in breadth in the upper row of straw; and to this hoop are fastened six or seven wooden spars, each one-fourth of an inch thick, and one-and-a-quarter of an inch broad, and half an inch apart from each other. To these bars the bees attach their combs. That greater steadiness may be given to the combs, to prevent their being broken or deranged when the hive is moved, a rod is run through the middle of it, in a direction across the bars, or at angles with them. A flat cover of straw, worked of the same thickness as the hives, and twelve inches in diameter, is applied to the uppermost storey, made fast to the hive with a packing-needle and thread, and carefully luted. Before it is put on, a piece of clean paper, of the same dimensions as the top of the hive, should be laid over the bars, to prevent the bees from working in the intervening spaces.

Besides the above, there is the Grecian hive, as used in the Greek islands, and sometimes called the Candiote hive. It is shaped like a flower-pot, and has a flat cover, adapted to the same purpose as that described in Wildman's hive. Huish adopted it, with some additional apparatus. There is also Lombard's hive, which is, to some extent, a storeyed one, but differing from others of that kind in having its upper storey less than half the capacity of the body of the hive. Whatever may be the merits of these hives, however, a decided preference has been given to Wildman's, both as regards the material of which it is made, and the mode of its construction. It is said to preserve a constant equability of temperature, and to enable the operator to practise the method of partial deprivation. Into the respective merits of bee-boxes and straw hives we will not enter; but we may briefly describe the hive invented by the celebrated Huber, and called by him the book or leaf-hive. In the bee volume of the *Naturalist's Library*, it is spoken of as possessing "more valuable properties, taken as a whole, than any other we are acquainted with." It is thus described —"The leaf-hive consists of eight frames, each eighteen inches high (English measure), and ten inches wide inside, having the uprights and top cross-pieces one-and-a-half inch broad, and one inch thick; so that the eight frames, when placed close together, constitute a hive eighteen inches high, twelve inches between end and end, and ten inches between back and front—all inside measure. The frames are held together by a flat sliding-bar, on each side secured by wedges and pins. To the first and eighth of these frames is attached a frame with glass, and covered with a shutter. The body of the hive is protected by a sloping roof, and the entrance is made through the thickness of the floor-board. . . . . In taking honey from this hive, the bee-master has the whole interior completely under his

eye, and at his disposal, and can choose what combs best suit his purpose, both as to quantity and quality; taking care, however, to do so only at such periods as will leave the bees time to replenish the vacancy before the termination of the summer season. It is also well adapted for artificial swarming. By separating the hive into two halves, the honey, brood-combs, and bees, will, generally speaking, be equally divided; and by supplying each half with four empty frames, we shall have two hives (one half empty), equal in number of bees, of brood, and even of stores. One of the new hives will possess the queen; and if the operation has been performed at the proper time—that is to say, a week or ten days before the period of natural swarming—the probability is, there will be royal brood coming forward in the other; at all events, there will be plenty of eggs and larvæ of the proper age for forming an artificial queen." For descriptions and diagrams of other hives, we must refer the reader to more extended treatises on this part of our subject, and also to the bee volume of the *Naturalist's Library*.

SITUATION OF THE APIARY.

The "house of bees" should face the south, with perhaps a slight turn towards the east, and should be protected from the north and prevailing winds. It should not be placed at too great a distance from the dwelling, lest its inhabitants become wary of man; nor should it be too near, lest they feel themselves disturbed by him. Its entrance should be crossed by no paths, nor should the homeward flight of the laden bees be intercepted by bushes or high trees. A quiet, retired spot, in low ground, is better than an elevated situation. Dr. Bevan says—"Excepting in peculiarly sheltered nooks, an apiary would not be well situated near a great river, nor in the neighbourhood of the sea, as, in windy weather, the bees would be in danger of drowning from being blown into the water. . . . . Yet it should not be far from a rivulet or spring: such streams as glide gently over pebbles are the most desirable, as these afford a variety of resting-places for the bees to light upon. . . . Water is most important to them, particularly in the early part of the season. Let shallow troughs, therefore, never be neglected to be set near the hives, if no natural stream is at hand." In the Isle of Wight, the people have a notion that every bee goes down to the sea to drink twice a day; and they are often seen to imbibe of the farm-yard pool, although clearer water may be near. It is thence supposed that a small piece of rock-salt might be of service to these winged insects, on the same principle that it acts favourably upon the bovine stock of the grazier.

THE DESTRUCTION OF BEES.

In order to obtain possession of the hoarded treasures of the bee, it was long deemed necessary to destroy it. The following simple method, however, has been adopted, as it is described by a writer in the latest edition of the *Encyclopædia Britannica*:—"Uncover the hole in the upper centre of a flat-topped straw hive or box, and place a glass vessel over it in such a way that no bee can get either in or out, except by the ordinary opening of the lower hive. The glass hive must be covered with an empty hive, or with a cloth, that too much light may not prevent the bees from working. As soon as they have filled the straw hive or box, they will begin to work up into the glass hive." Mr. Thorley made the addition of a glass window to his hives, that he might witness the progress which his bees made; and which was of some consequence, particularly if one hive was to be taken away before the season was over for their collecting honey; for when the combs are filled with honey, the cells are sealed up, when the bees forsake them, and live mostly in the hive where their operations are carried on.

For the purpose of uniting swarms, and also for artificial swarming, chloroform has been applied with success. It is also used for the purpose of taking the honey from the hive. A quarter of an ounce, placed in a saucer, covered with a perforated card, or with wire gauze, should be placed on the board of the hive, and all apertures carefully closed. In about half a minute the bees will have fallen completely under its influence; and, on the admission of air, after fifteen or twenty minutes have elapsed, they will be restored to their functions, and the capacity of using their wings.

DIVISION XII.

ANGLING.

ANGLING APPARATUS; RODS; LINES; HOOKS; ARTIFICIAL FLIES; BAITS FOR ANGLING; THE SALMON; THE COMMON RIVER TROUT; THE GREAT LAKE TROUT; THE GRAYLING; THE PIKE FAMILY; THE CARP FAMILY; THE COMMON CARP; THE BREAM; THE TENCH; THE BARBEL; THE CHUB; THE DACE; THE ROACH; THE BLEAK; THE GUDGEON; THE MINNOW; THE LOACH; THE EEL FAMILY; THE COMMON EEL; THE PERCH; CONCLUSION.

ANGLING APPARATUS.

An angler, to be well equipped, requires to carry many things about him. The most necessary articles consist of rods, lines, reels, hooks, baskets, and landing-nets. Besides these, he must have a stock of different kinds of feathers, such as those which are denominated hackles, and which are taken from the necks and backs of common poultry, as well as from the wings of woodcocks, rails, snipes, plovers, grouse, partridges, chicks, and others. He must also carry with him some of the furs of animals. The most useful of these are such as are taken from squirrels, hares, martins, moles, mice, and water-rats. The hackles which anglers hold in highest favour are the *duns*; but since the introduction of Spanish poultry, black hackles have come into use. Christmas is the most suitable time to pluck the hackles from their owners; but, independent of these, the feathers of the peacock, and of other showy birds, are sometimes useful. The sea-trout and the salmon are attracted by the gaudy plumage of the parrot, and those of other tropical birds, deeming them, under the deceptive forms of flies, no doubt, exotic morsels of great delicacy. Silks are another necessary with which the angler cannot dispense. The first of these is what is called Barber's silk, which is used double for splicing the top-pieces of rods; the second is not so strong, its use being to fasten on the rings through which the line on the reel runs; the third consists of fine netting silk for dressing flies and whipping hooks. Besides these the angler should carry with him a pair of scissors with fine points, small pliers, wax and needles, as all these are necessary to his thorough equipment for practising his art with pleasure.

RODS.

Numerous are the kinds of rods which have been invented for angling; but, in purchasing this instrument, the nature of the fishing intended to be pursued should enter first into consideration. To show the necessity of this, we may mention that there is a special kind of rod for fly-fishing, bottom-fishing, and a trolling-rod; there are also the single and double-handed rod, the bag-rod, the cane and the wood, and the walking-stick rod, with a great many more smaller varieties. The general rod, however, is the most convenient for the young practitioner, or for use when travelling in localities where there is no certainty as to the sort of fish that may be taken. According to Colonel Hanker, a trout rod should be about twelve feet three inches long, and about fourteen ounces in weight. It must not be top-heavy, nor must it have too much play in the lower part; but the play should be just in proportion to the gradual tapering, by which there will be very little spring till after about the third foot of its length. It is difficult to determine the exact degree of pliancy which a fly-rod should have; but a stiff rod is worse than a pliant one, and never can be used advantageously. The fly-fishers, both of Scotland and Ireland, use more flexible rods than those of England; and many of the sportsmen of these countries are famous for their piscatory feats. *Christopher North* is one example.

LINES.

The lines of the angler are either composed of the gut of the silkworm, or of silk and hair combined, horsehair, cow-hair, and also of Indian and other grasses. They are either purchased or made by anglers themselves; but the lines of the tackle-makers are generally reputed the best. The *hair-line* is described, by Mr. Daniel, as requiring much knowledge in procuring the materials of which it is to be composed. The hair should be taken from "a young, healthy, grey, or white stallion," from the middle of the tail, and it should be of "a pale, transparent, water colour." He adds, that hair must not be touched with oil, or it will become hollow and rotten. This, however, is doubted; but who would take all this trouble, when a better line could be purchased for half the value of even the time it would take to make one ourselves? Many artists, however, prefer making their own tackle, not with the view of saving time and expense, but from the pleasure which it gives to fish with that which is of their own manufacture.

The single-hair line is used by many of our best anglers, at bottom, for roach, dace, and other *fine* fishing. On the advantages of this sort of line, Mr. Salter, in his *Angler's Guide*, speaks at large; but we may state, that, as a general rule, of whatever material a line is made, if it is not already of the colour of the water usually fished in, it should be dyed to that colour.

HOOKS.

The principal hooks made use of by the practical English angler, come under the denominations of the Limerick, the Kendal, the Sneakbend, and the Kirby. To trace the progressive history of these little instruments, from the primitive simplicity of their invention up to their present perfected state, might be interesting, but it could not be useful. We will, therefore, briefly state, that upon the quality of the material of which they are made, much of the success of the angler depends. Mr. Blaine observes, that "every fish-hook should be manufactured of a proper temper:" by which he means, that it should be capable of resisting all ordinary force applied, without snapping, and be tempered so equally that it will not snap. Each hook should be kept separately in the flannel with which the hook-book should be furnished, whether the hook be gimped, or gutted, or naked.

ARTIFICIAL FLIES.

To describe all the artificial flies used by the angler would occupy a large space; but a few of the most popular must not be omitted. Those who wish for a fuller list, may consult the *Fly-fisher's Entomology*, by Alfred Ronalds; or Blaine's *Encyclopædia of Rural Sports*. The first we shall speak of is the *Black Gnat*, which appears about the end of April. It should be made of the light part of the wing-feather of any dun-coloured bird, and should be dressed thick and short. The tail should be of mohair, or black ostrich, which is preferable. Trout, as well as grayling, will occasionally rise to this fly, even so early as February and March. Besides the Black Gnat, there are the Alder, or Red-fly; the Dark Dun; the Blue Dun; the Black Palmer Hackel; the March Brown, and several others. The wings of this last are formed from the mottled feathers of the tail of a partridge; the body consists of the fur of a hare's ear, mixed with a little yellow worsted; the legs are a grizzled hackle. This fly continues to the end of April. According to Mr. Bainbridge, author of the *Fly-fisher's Guide*, this fly may be used during mild weather in February. It is made from the dull feathers of a mallard's wing; the body of mole-fur, mixed with a little dark-brown mohair; and a dark grizzled hackle composes the legs. Salmon often rise to this fly, which may be successfully used early in the morning throughout the fishing season. The *Hazel-fly* is famous for May and June fishing, where bushes are plentiful. It is made of black and purple ostrich harl, twisted together; the wings should be of the light-brown feathers taken from under the wings of a thrush; and a bluish hackle should be taken for the legs. Some of the flies, as enumerated for April, by Mr. Blaine, are—The Red Dun, Orange-bodied Dun; Ashy Dun; Large Spider, or Crane-fly; the Oak-fly, and the Stone-fly. Those for May are—The Later Willow-fly;

the Bright-yellow Dun; Cream-coloured Dun; Dun Cat; Green Drake; Grey Drake, or May-fly; Land-fly; Wasp-fly; White Moth, and Brown Moth. For June—The Oil-fly; Ephemeral Red Spurness Humble-bee; Hazel-fly (already mentioned); House-fly; Large Blow-fly, and Blue Gnat. For July—The Large Black Ant-fly; Large Red Ant-fly, and the Blue-blow. For September—The Golden Dun; Dark Dun; Alder, or Red-fly; Late Dark-bodied Willow-fly, and the Cinnamon, or Fetid Brown-fly.

In reference to the artificial flies used in salmon-fishing, there are certain writers who recommend different sorts of salmon-flies; and among these are Bainbridge; Sir Humphry Davy, in his *Salmonia;* Taylor, Captain Williamson, and the Rev. R. Lascelles, in his *Letters on Sporting.* In this last work, seven flies are enumerated and described as applied to fishing in North Wales; but to insert them here would occupy too much space. He says, however, that all the salmon flies of North Wales, with the exception of the wasp and hornet, should be made to imitate dragon-flies, being the only large ones that are seen playing about the rivers there.

BAITS FOR ANGLING.

Baits are numerous, but the best for trout are well-scoured earth-worms. The garden, the dew, and the lob-worms are all of the same species, notwithstanding that they vary considerably in the points of size, form, and colour, in accordance with their ages, and the season and soils in which they are found. According to Daniel, there are two kinds of lob-worm—the old, which is *knotted,* and the young, which is destitute of *knots,* and which is sometimes called *maiden* lobs—as well as *red* worms. The latter is in highest esteem among anglers. These, with other sorts of worms, are obtained in fields and gardens, but more abundantly in such places as contain soil recently mixed with vegetable or animal remains. Another worm, called the brandling, is, from its head to its tail, streaked with red and yellow in alternate circles, but darker at its anterior than at its posterior portion. It is usually found among rotten tan bark, heaps of rich vegetable mould, and old dung-hills. The palmer-worms, or wool-beds, are the hairy caterpillars of certain moths which fly about in the night. They are taken by trout, and are capable of preservation for many weeks, in a box with damp earth, covered with some of the bush leaves on which the insect is known to feed. Bees and wasps are, also, bait for the angler. The roe of the salmon is greatly praised by Barker, who seems to have been the first to discover its merits as a bait. Pastes, too, are of great value to the fisher; among which the following have been recommended as good sorts:—A *red* paste is made with a large spoonful of fine wheat-flour, moistened with the white of an egg, and worked with the hands until tough. A small quantity of finely-powdered loaf-sugar should be added, with some cotton wool spread over the paste when flattened by the hand. The cotton should be well mixed with it, and the whole dyed with a little vermilion. It will keep good for a week, if a piece of fresh butter be added to it. By omitting the colouring matter, *white* paste may be composed of the same ingredients; *yellow,* also, using a little turmeric as a colouring. To make a salmon-paste—Take one pound of salmon-spawn, in September or October; boil it about fifteen minutes; then beat it in a mortar until sufficiently mixed with one ounce of salt, and a quarter of an ounce of saltpetre. Pick out the membrane in which the spawn is contained, as it is disengaged from it. After it has been beaten to a proper consistence, put it into gallipots, and cover it over with bladders, tied down close, and so preserve it for several months. Minnows are frequently used by anglers as a bait for trout, and the tackle employed is both lighter and finer than that used for the salmon, with a single line of gut at the bottom. With this, very large fish are frequently captured.

We shall now describe some of the principal kinds of fish, the snaring of which form the chief object of the angler's art.

THE SALMON.

This is the king of fresh-water fishes; and the family to which it belongs is, in an economical point of view, the most important in the eyes of the angler. It embraces the grey trout, salmon trout, common trout, Loch

Leven trout, Great Lake trout; the charr, smelt, grayling, groniad, vendan, poman, pollan, and the argentine. It would occupy too much space to do more than thus notice the whole of these; but some of the principal of the species must be described. The most characteristic feature of the family is the peculiar form of the posterior dorsal fin, which is fleshy and adipose, or destitute of rays. The enumeration we have given, however, does not constitute quite one-half of the family, when viewed in relation to Europe. Both America and Africa produce other forms; but these, to some extent, deviate from the typical structure. The most characteristic members are the most northerly fresh-water fish with which the naturalist is acquainted. According to the opinion of some anglers, the salmon bites most frequently from about six o'clock in the morning to eleven in the forenoon; and from three in the afternoon till sunset. The best months are those of March, April, May, and June. Sometimes this noble fish measures four feet in length, and weighs upwards of seventy pounds. The capture of such a *pisces* is a prize indeed. The most successful bait to take it with is the artificial fly, made in imitation of butterflies and dragon-flies of various kinds. At the foot of a strong stream, where there is an eddy or a whirlpool, salmon are most frequently found when feeding; and old Walton observes, that you shall find he does not usually stay long in a place, as trouts will, but covets still to go nearer the spring-head. In trolling with the minnows or other small fish, the foot-lengths ought to be about three yards, and provided with one or two swivels, to prevent the line from twisting, as well as to allow the bait to have free play.

THE COMMON RIVER TROUT.

This is the *salmo fario* of Naturalists; and although, perhaps, the best known of our fresh-water fishes, it is among the most beautiful of the species. It is generally distributed not only throughout Great Britain, but over the whole of Northern Europe, and that, too, in such abundance that there is hardly a collection of water of any extent, whether running or stationary, in which it is not to be found. It is pre-eminently the angler's fish, as it is always open to the temptation of bait, and may be taken by the rod, at almost any time of the year, not even excepting the winter months in favourable weather; but during the proper fishing season, when the river or lake is in good condition, it is almost certain to afford plenty of sport. It would appear that there are some strange and unaccountable differences to be seen in several of the same species of fish, but more particularly in trout. This was observed by Isaac Walton, who says—"I tell you, that you may the better believe that I am certain, if I catch a trout in one meadow, he shall be white and faint, and very like to be lousy; and as certainly, if I catch a trout in the next meadow, he shall be strong, and red, and lusty, and much better meat. Trust me, scholar," he continues, "I have caught many a trout in a particular meadow, that the very shape and the enamelled colour of him hath been such as joyed me to look on him; and I have then, with much pleasure, concluded, with Solomon, 'Everything is beautiful in his season.'" This fish is generally supposed to rise more freely during gloomy weather, succeeding clear, bright nights; as, when the moon is clear, they confine themselves to shadowy places. It is, therefore, supposed that in the following day they are hungry, and more ready to snap at bait.

THE GREAT LAKE TROUT.

This is the *salmo ferox* of Natural History, and sometimes weighs two pounds; though its usual weight is under one. In the first volume of the *Naturalist's Library*, it is said that "some varieties spawn about Michaelmas, ascending, for a short way, the rivers that feed their native lakes; others spawn in the end of December, and deposit their ova in the shallow parts of the lake. The *charr* occurs in all the three kingdoms, although it is by no means generally distributed. The northern lochs of Scotland yield it in tolerable plenty; it is also found in Orkney, and has been long known in some of the Welsh lakes. As it haunts deep, cool water, and is seldom found at the surface till late in the autumn, it is not frequently made an object of sport with anglers. In the Cumberland and Westmoreland lakes, however, it may be taken

sometimes in tolerable plenty, by trolling, and occasionally it rises to a fly. The different states and varieties are known in England as Case charr, Gilt charr, Red charr, Silver charr, &c." Returning to the *Great Lake Trout*, we find it stated, by Mr. Wilson, in his article on "Angling," in the last edition of the *Encyclopædia Britannica*, that "the ordinary method of fishing for this king of trouts is with a powerful rod, from a boat rowing at the rate of from three to four miles an hour—the lure a common trout, of from four to eight inches in length, baited upon six or eight salmon hooks, tied back to back upon strong gimp, assisted by two swivels, and the wheel-line coarse and strong." Yet all this, he adds, is, in the first impetuous efforts of the fish to regain its liberty, frequently carried away for ever into the crystal depths of Loch Ane!

THE GRAYLING.

In the *Salmonica* of Sir H. Davy, an opinion is expressed that the grayling has been introduced to our rivers; but it is not a common fish in some parts of this island. In the *Salmonica* its localities are stated to be the Avon, in Hampshire; the Severn and its tributaries, in North Wales; the Wye and its tributaries; the Lug, in Herefordshire; the Dee, Dove, Trent, and Blithe; the Ribble, Erne, Wharf, Humber, Derwent, and Rye, in the north of England; and in the Esk and Eden, in Cumberland, it is also occasionally caught. These are considered its most northern localities on the mainland; but Lowe affirms that it is very frequent in the Orkney Islands. It has neither been found in Scotland nor in Ireland, notwithstanding that it is common in much colder parts, being abundant in Lapland. Mr. Wilson, also, says that he has killed it readily in Switzerland, with a moor-fowl wing and hare-ear body.

THE PIKE FAMILY.

The representatives of this family in the British favour are the Pike, Garfish, Savory Pike, Half-beak, Flying Fish, and the Great Do. The common pike is designated by Lacépède as "the shark of the fresh waters;" and by Walton as "the tyrant of fresh waters." The voracity of this fish is enormous; and one which was kept in the preserve of Bushy Park, Mr. Jesse tells us, possessed an appetite almost insatiable. He threw to him one morning, one after another, five roach, each of about four inches in length, four of which he swallowed, keeping the fifth in his mouth for about a quarter of an hour, when it also disappeared. In this preserve there were eight pike, of about five pounds each; and, out of 800 gudgeons which were counted into the reservoir, there were, at the end of three weeks, hardly any to be seen, though some barbel and perch probably had their share. The fish is in season from May to February, and is angled for by trolling with a strong-topped rod. The fresher and cleaner the bait is kept for this fish, whether for trolling, snap-fishing, or line-bait, the more likely is the angler to succeed in taking him. The fish delights in the bends of rivers and the bays of lakes, where there is no great depth of water, and where reeds, weeds, and water-lilies are plentiful. In trolling for him, it is advisable to keep as far from the water's edge as possible, and to begin by casting close by the near shore, with wind blowing against the bank; but when the weather is bright, and the water clear, there are some anglers who prefer fishing against the wind. It is said that the largest pike ever taken in Britain was done with a peacock-feather fly, in Loch Ken, near New Galway. Its weight was seventy-two pounds. According to Mr. Colquhon, the most deadly way of catching the pike is by set lines; and the best time "is on one of those delicious evenings with scarcely a breath of air, when the shadow of the mountain becomes more imposing on the unrippled loch, and twilight begins to steal over the scene."

THE CARP FAMILY.

This is a numerous family, but it has not a large number of representatives in the British fauna. Among these are the Common Carp, the Bream, the Tench, the Chub, the Barbel the Roach, the Dace, the Bleak, the Gudgeon the Minnow, and a few others less generally known in this country. To each of these we will devote a few lines.

THE COMMON CARP.

To angle for this fish, old Isaac says a very

large amount of patience is required. In the winter months it haunts the broadest and least disturbed parts of rivers, where the bottom is muddy and soft; but in summer it usually occupies deep holes beneath hollow banks, under the roots of trees, or in the neighbourhood of beds of aquatic plants. On account of its being a wary fish, it is difficult to deceive it when it has "come of age." The best months to take it are May, June, and July; and the best times of the day are from sunrise to eight in the morning, and from sunset throughout the time of twilight, and onwards through the night. Mr. Daniel says that "three rods may be employed, one with the bait at mid-water, another a foot or less from the bottom, and the third to lie upon it when the line and lead are not discovered, as in the two former. The places intended to be fished in should, the night before, be ground-baited with grains, blood, and broken worms, incorporated together with clay; the hook bait should be red worms taken out of tan, flag or marsh-worms, green peas, so boiled as to soften, but not to break the skin, and throwing some in now and then. When this bait is used (which should be with one on the hook to swim a foot from the ground), in case of a bite, strike immediately; a large carp, upon taking the bait, directly steers for the opposite side of the river or pond."

THE BREAM.

The carp-bream is called by Walton a large and stately fish, which thrives best in large pieces of water, and in deep, quiet rivers. It is to be found in the Mole and the Medway; and also in the Cumberland lakes. In those of Ireland it has been caught of such a size as to weigh from twelve to fourteen pounds. In Scotland it is little known, Lochmaven being its only recorded habitat. May is the time for spawning, when they feel rough to handle. This, however, according to Mr. Yarrell, "is nothing more than a periodical assumption, which, as in the other Cyprida, disappears when the season of reproduction is passed." A well-conditioned earth-worm is said to be the best bait for bream; but wasp-grubs, grasshoppers, and paste made of bread and honey, will all lure them to their destruction. For angling this fish Walton gives very minute instructions. He tells us carefully to study the selected spot; advises an abundant supply of ground-bait, and a visit, with fitted tackling, to the water-side, about three or four o'clock in the morning. The angler, however, is not to venture too near the water, as bream "have a cunning sentinel, and are watchful themselves too." Mr. Daniel gives the following account of a day's sport in Essex with this fish:—"The weather was cloudy, and the wind brisk; there were seven rods used by the party, and very frequently were there biters at them all at the same time. When a fish was hooked, and played at the top, or near the surface of the water, numbers were seen to follow him; and as soon as the hooks were fresh baited, were alike greedily taken. They averaged at least two pounds a fish; and of these, from six in the morning till dusk in the evening, some hundredweights were taken."

THE TENCH.

As an agreeable habitat the tench is said to prefer ponds to rivers, and pits to both. Where it is found in rivers it is mostly in those which are slow and deep; but in such situations it does not breed so abundantly as it does in ponds. In deep pits, in which clay for bricks has been dug out, it is often plentiful, as it likewise is in broad, shallow waters, on muddy bottoms. It is alleged that this fish is possessed of certain sensitive properties, which render it invaluable to other piscatory tribes as a physician. Indeed, in Germany it is called the Doctor-fish; and hence Boccius affirms that no fish of prey will ever touch a tench. Walton says—"I hope I may be so bold as to tell you that the tench is the physician of fishes, and for the pike especially; so that a pike, being either sick or hurt, is cured by the touch of the tench; and it is observed that this fresh-water tyrant will not play the wolf to his physician, but forbears to devour him though he be never so hungry." The fish spawns from June till September, and is in best condition from the latter month till the end of May. As bait, small marsh-worms, middle-sized lobs, or the red species found in rotten tan, are recommended. Walton says, "he will bite at a paste made of brown bread and honey, or at a marsh-worm or a lob-worm: he inclines very much to any paste with which

tan is mixed, and he will bite also at a smaller worm with his head nipped off, and a sod-worm put on the hook before that worm; and I doubt not but he will also, in the three hot months—for in the nine colder he stirs not much—bite at a flag-worm, or a green gentle; but can positively say no more of the tench, he being a fish that I have not often angled for; but I wish my honest scholar may, and be ever fortunate when he fishes."

THE BARBEL.

This "bearded fish" (so called from the cirri at its mouth) is pretty common throughout Europe, although it is not known in Scotland. Mr. Jesse tells us that it is an extremely sly fish; although in the spring, when supposed free from observation, it will roll itself about, and exhibit a considerable degree of playfulness. He also remarks, that, in very cold weather, it appears to be in a perfectly torpid state. "They make their hybernaculum amidst tufts of weeds at the bottom of the Thames, apparently either asleep or insensible. Indeed, so torpid are they, that they may be taken up by the hand. In very cold weather, the fishermen provide themselves with a net fastened to an iron hoop, having a handle to it, which they place near the fish, and, with a pole, put it into the net, so perfectly inanimate are they at this season." The barbel is rather particular in the baits he will take; they must, therefore, be kept clean and sweet, and be untainted with the scent of musty moss. The angling season begins in May, and continues till September; and the best hours are from daylight till ten in the morning, and from four in the afternoon till sunset.

THE CHUB.

This fish is common both in England and Wales. It is also found in the waters of Annan, Scotland, and in many parts of the neighbourhood of the English lake country. It is called the Skelly, because of the largeness of its scales. In the deep holes of rivers it is found; and, during the summer months, commonly lies on the water's surface, enjoying the shade of some bush or tree. Timidity being one of its principal characteristics, it sinks to the bottom on the slightest alarm, although it will soon again resume its position. It will rise at a fly, and feeds generally on worms and insects. The baits employed are beetles, maggots, grasshoppers, salmon-roe, &c. It is called by Pennant a coarse fish; but one of the best ways of preparing it for the table is by boiling it with the scales on.

THE DACE.

This fish is known in some parts of England under the designations of the dare and the dart: it bears a strong resemblance, both in its appearance and habits, to those of the roach. It is gregarious, and frequents the deep waters close by the piles of bridges, or beneath masses of collected foam caused by rapid eddies, or in shady pools. They are taken with the red-worm, brandlings, &c.; but will rise at a variety of flies. In the Thames, above Richmond, as soon as the weeds begin to rot, they will rise freely from the shallows to a grasshopper, used as an artificial fly in hot weather.

THE ROACH.

The common roach (*L. rutilus*), which Walton designates the *water-sheep*, on account of its simplicity or foolishness. This fish is common to many parts of England, as well as to the temperate parts of Europe. It is rarer in Scotland, and haunts still rivers and lakes, confining itself, during the day, to the deeper parts, and, in the night, feeding in the shallows. During the winter it seeks other haunts, and in the months of May and June ascends the shallows to spawn. The proper season for roach fishing in the Thames, where it grows to a larger size than in any other river, begins about the end of August; and Walton tells us to fish for it in winter, with paste or gentles; in April, with worms or caddis; in the very hot months, with little white snails, or with flies under water. In many of the hot months roaches may also be caught thus:—"Take a May-fly, or ant-fly; sink him, with a little lead, to the bottom, near the piles or posts of a bridge, or near to any posts of a weir; I mean, any deep place where roaches lie quietly; and then pull your fly up very leisurely, and usually a roach will follow your bait to the very top of the water, and gaze on it there, and run at it and take it, lest the fly should fly away from him." This is from old

Isaac, who further states, that in the Thames many have been taken weighing two and a-half pounds; and Mr. Jesse mentions that the largest he had known taken, weighed three pounds; but if we are to credit Mr. Pennant, the London fishmongers sometimes see them as large as five pounds.

THE BLEAK.

The bleak, or blink, is common throughout England, and abounds in the Thames, and over rivers in the vicinity of London. Libbald says it is a native of Scotland; but whether this opinion has received due confirmation we are not aware. It is gregarious, swimming in large shoals, and spawning in May, when its scales are rough to the touch. It is a small and active fish, and may be taken with a small red worm, gentles, or a fly. In angling for it, the tackle must be very fine.

THE GUDGEON.

The common gudgeon abounds in the European continent, as it also does in the southern parts of England. Like many of its compeers, however, it is unknown in Scotland. Its usual length is from five to six inches; but it is stated by Mr. Pennant, that those caught in the Kennet and Cole are three times the weight of those taken elsewhere. The largest he ever heard of was taken near Uxbridge, and its weight was half a pound. The gudgeon frequents the shallows during the hot months; and before the winter finally sets in, retires into deeper waters. It is angled for near the ground, with a small red worm.

THE MINNOW.

This is a pretty little fish, and is common to the continent of Europe, to England, and the southern parts of Scotland. Isaac Walton tells us that this fish is "a sharp biter at a small worm; and, in hot weather, makes excellent sport for young anglers, or boys or women that love that recreation; and in the spring they make of them excellent minnow-tansies; for being washed well in salt, and their heads and tails cut off and gutted, and not washed after, they prove excellent for that use; that is, being fried with yolks of eggs, the flower of cowslips, and of primroses and a little tansie. Thus used, they make a dainty dish of meat." It may be so; but speaking for ourselves, we are by no means admirers of some of the piscatory dishes recommended by the enthusiasm of old Isaac.

THE LOACH.

This fish we have often heard called the "Beardie" in Scotland, where it is common, as it is in both England and on the continent of Europe. It has six cirri on the snout, and its nose is destitute of spines. It haunts streams with gravelly bottoms covered with large stones, under which it lurks. It does not often exceed four inches in length, and it feeds upon worms and aquatic insects. It is very prolific, spawning in the spring. It is considered a nutritious food for man, and is an excellent bait for eels.

THE EEL FAMILY.

Of this family there are given, in the *Naturalist's Library*, eleven species as the representatives in British fauna. "When it is stated," says the writer on fish in that work, "that the type or most characteristic representative of this family is the common eel, one of the most familiarly known of our native fishes, little more need be added to convey an idea of the general appearance of the species. Differing considerably from each other in the details of their structure, they possess in common, a long, narrow, serpent-like body, which, owing to the conformation of the vertebral column, is extremely flexible; the greater part of the body surrounded by a low, nearly continuous fin; scales so minute as to be, for the most part, almost invisible, and the surface frequently invested with a slimy mucus. The cæca are wanting; but all have an air-bladder, which sometimes assumes a very peculiar form." The common eel being the type, we will confine ourselves to a brief notice of it.

THE COMMON EEL.

The *sharp-nosed* eel is regarded as the common one, although the *broad-nosed* is in many parts equally abundant. It is found in all the fresh waters of this country; and, with the exception of the Arctic regions, and a few of the rivers, such as the Wolga and some of

the tributaries of the Danube, which have their source in very cold regions, abounds throughout Europe. It also occurs in Asia, in the great islands of the Pacific Ocean, and in North America. Strictly speaking, it is a fresh-water fish, in which it can permanently subsist. Its habits are nocturnal, and the largest and finest are usually caught with night-lines. They give little amusement to anglers accustomed to the more elegant branches of their art, as they are a troublesome fish, and from their great tenacity of life, and their tortuous motions, often destroy the tackle of the fisher.

THE PERCH.

This is the last fish we shall here notice. When it attains to three pounds in weight it is considered of a large size. It thrives well, both in lakes and rivers, in the latter of which it prefers the sides of the streams to the more rapid parts of the current. It is very common in temperate climates, and generally abounds throughout Europe. In the south of England, Wales, Ireland, and in the lowlands of Scotland, it is common. Mr. Selby says that it is a rare fish in the north of England, and still rarer in the northern parts of Scotland, being met with only sparingly in the lochs north of the Forth; and, in several instances, when found in these localities, its introduction can be traced to no remote period. "In all the almost countless waters," he adds, "of the northern counties, it is wanting." It is gregarious in its habits, and is angled for with a worm or minnow. In the winter it is very abstemious, but in the summer it is a bold biter. When the weather is cool and cloudy, with a rullling breeze from the south, perches will bite the whole of the day. The best fishing-hours, towards the end of spring, are from seven to eleven in the morning, and from two to six in the afternoon. In warm and bright summer weather, a good time is from sunrise till six or seven in the morning, and from six in the evening till sunset.

In closing this, the last division of RURAL LIFE, we think we cannot do better than quote the following lines, from a fishing poem nearly two centuries and a-half old, and respectfully recommend them to the perusal of the angler.

"The lofty woods, the forests wide and long,
Adorn'd with leaves and branches fresh and green,
In whose cool bowers the birds, with many a song,
Do welcome with their quire the summer's Queen;
The meadows fair, where Flora's gifts among,
Are intermixed with verdant grass between;
The silver-scaled fish that softly swim
Within the sweet brook's crystal watery stream.

"All these, and many more of His creation,
That made the heavens, the Angler oft doth see;
Taking therein no little delectation,
To think how strange, how wonderful they be
Framing thereof an inward contemplation,
To see his heart from other fancies free;
And whilst he looks on these with joyful eye,
His mind is rapt above the starry sky."

THE END.

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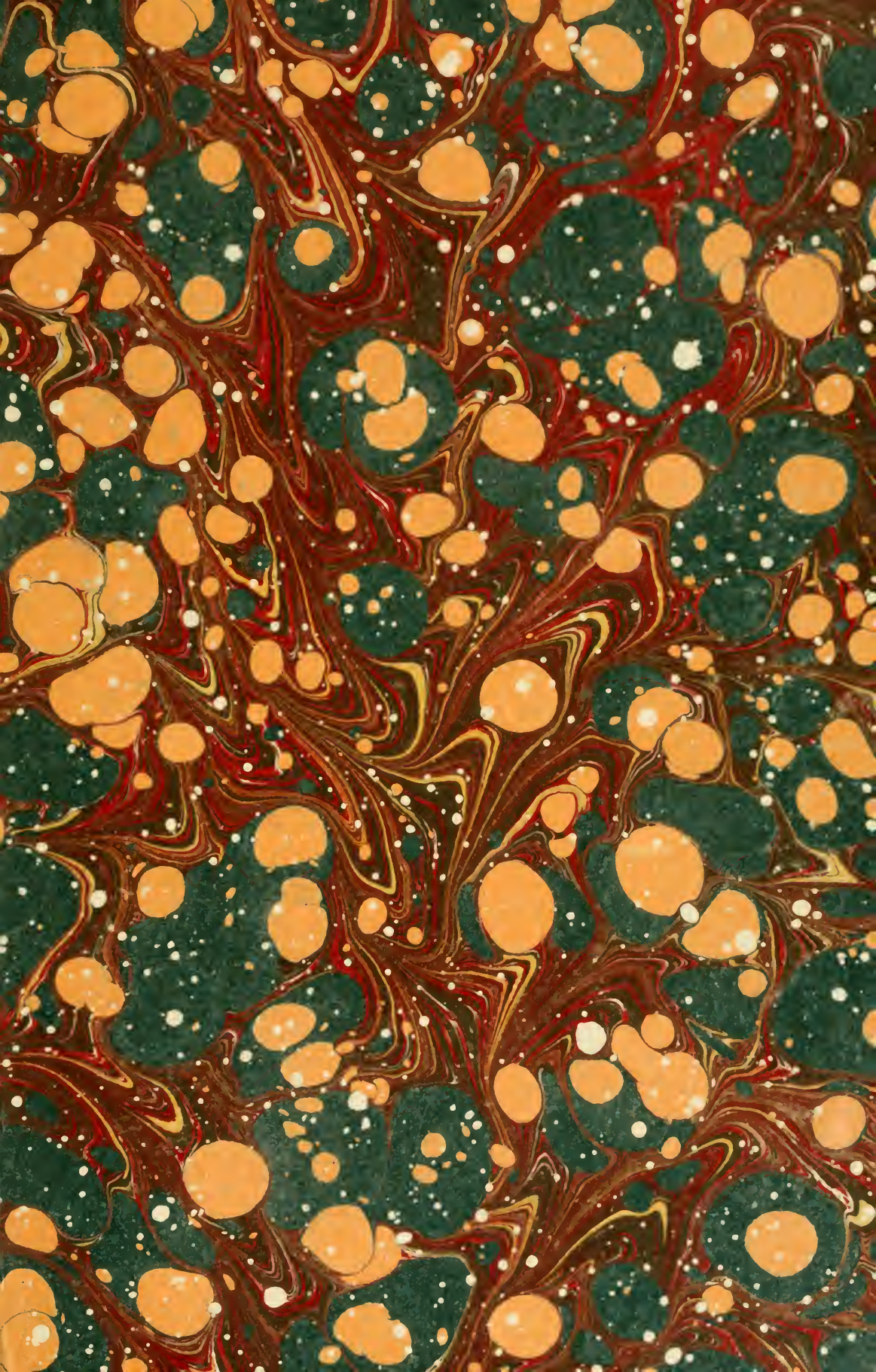
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